



**A DELPHI EXPERT ASSESSMENT OF PROACTIVE CONTRACTING IN AN
EVOLUTIONARY ACQUISITION ENVIRONMENT**

THESIS

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AFIT/GAQ/ENV/03-09

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THESIS

Presented to the Faculty
Department of Systems and Engineering Management
Graduate School of Engineering and Management
Air Force Institute of Technology
Air University
Air Education and Training Command
In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Acquisition Management

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March 2003

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Acknowledgements

I would like to express my sincere appreciation to my faculty advisor, Major Paul Thurston, for his guidance and support throughout the course of this thesis effort. I would also like to recognize the other members of my advisory committee, Mr. Leon Mable and Kenneth Farkas for their contribution to this work. The successful completion of this report is largely a result of the entire committee's leadership, insight, encouragement, and expertise. I am forever in their debt.

Special thanks are due to the sponsor of this effort, Colonel Jeffrey Parsons, Director of Contracting for the Air Force Materiel Command and to the members of the expert panels from AAC, ASC, and ESC. Without their strong support, the collection of the information necessary for this report would have been impossible.

Finally, to all those who nurtured me over the past eighteen months, beyond academics, I cannot overstate my gratitude. To my wife—for her love, patience, support, understanding, faith and strength through the madness. To my children—for enduring the long hours of my being away and understanding that Daddy sometimes had sleepovers at work. To Martin Trent—for listening to my endless babble and providing sanity checks. To my colleagues at AFIT LSB—thanks for all the support, conversations, and especially the free office space.

Gary L. Wellman

Table of Contents

	Page
Acknowledgements.....	.iv
List of Figures.....	vii
Abstract.....	viii
I. Introduction	1
Background.....	1
Purpose.....	5
Research Questions.....	5
Scope.....	6
II. Literature Review.....	8
Introduction.....	8
Traditional Acquisition Process.....	8
Evolutionary Acquisition Process.....	14
Funding and the Budget Process.....	17
Traditional Contracting.....	19
Evolutionary Acquisition Contracting	24
Summary	25
III. Methodology	27
Overview.....	27
Basis.....	27
The Delphi Method.....	30
Research Design.....	38
IV. Findings and Analysis.....	42
Overview.....	42
Delphi Round 1	42
Delphi Round 2	54
Summary	72
V. Conclusions and Recommendations	73

	Page
Overview.....	73
Conclusions.....	73
Recommendations.....	77
Limitations	78
Recommendations for Future Research.....	79
Summary	81
Appendix A: Expert Panel Membership.....	82
Appendix B: E-mail of Initial Information and	84
Delphi Round 1 Questionnaire to Participants	
Appendix C: Contract and Agreement Types.....	86
Appendix D: Synopsis of Responses for Delphi Round 1	92
Appendix E. Delphi Round 2(a). AAC Question Set	122
Appendix F. Delphi Round 2(a). AAC Question Set	131
Appendix G. Delphi Round 2(c). ESC Question Set.....	140
Appendix H. Synopsis of Responses for Delphi Round 2(a)--AAC Specific Questions	145
Appendix I. Synopsis of Responses for Delphi Round 2(b)--ASC Specific Questions..	166
Appendix J: Synopsis of Responses for Delphi Round 2(b)--ESC Specific Questions .	177
Bibliography	187
Vita.....	191

List of Figures

	Page
Figure 2-1. The Waterfall Model.....	10
Figure 2-2. Average Acquisition Cycle Times.....	14

Abstract

This study used structured group discussions (The Delphi Method) among three groups of contracting professionals from the Air Armament, Aeronautical Systems, and the Electronic Systems Centers in order to identify potential roadblocks to implementation of Evolutionary Acquisition strategies. The Delphi groups also tackled the problem of identifying and exploring potential business strategies that may counter the identified challenges. Discussions revealed that current laws, regulations, and internal processes pose challenges in an evolutionary acquisition environment. No single business strategy emerged as the best way to implement the EA strategy. Participants suggested that all three Centers concluded that robust business planning, pre-contract agreements between the Government and the contractor, long-term relationships, and encouraging team behavior are key factors. Participants from all three Centers are accommodating evolutionary acquisition with current contract types. Multiple contract types are being combined under one contract vehicle; award and incentive fees are being tailored to motivate specific contractor behavior. The best strategy for an evolutionary acquisition may be a strategy that is tailored to the specific requirement.

A Delphi Expert Assessment of Proactive Contracting in an Evolutionary Acquisition Environment

I. Introduction

Background

Reducing the time to develop and field new weapons and equipment is a critical issue in determining the responsiveness and effectiveness of the acquisition system. According to J. Michael Hanratty of the Office of the Under Secretary of Defense (Acquisition and Technology) "obsolescence risks are significant because technology cycle time, sometimes on the order of months, far outpace weapon system development cycle time, typically 8 to 15 years. By the time a system is fielded, supporting technologies are often outdated -- the US. Military cannot afford to be 3 or 4 technological generations behind what is available to the commercial market" (Hanratty et.al. January 2003). Unfortunately, this is not a new issue, in 1986 the Packard Commission stated that "the unreasonably long acquisition cycle is the central problem from which most other acquisition problems stem...It leads to unnecessarily high development costs and obsolete technology in our fielded equipment." (President's Blue Ribbon Commission on Defense Management 1986:47). To exacerbate the situation further, processor speed now doubles every 18 months while bandwidth doubles every 12 months (Waldo 2000:3).

Therefore, any system that requires over 18 months to field is already incorporating outdated technology.

Research has demonstrated that lengthy development cycles substantially impact system life cycle costs. Sustainment costs for existing systems also rise as the development cycles for replacement systems lengthen. Costs associated with diminishing manufacturing sources (DMS) rise earlier in the project life, in some cases like the F-22 Program, even prior to the beginning of production. Despite this evidence of increased cost, the acquisition response times for our major systems today often exceed the 8 to 15 years mentioned by Hanratty.

Several recent initiatives have attempted to address this problem. On January 19, 2002, the Under Secretary of Defense (Acquisition, Technology, & Logistics), Mr. E.C. “Pete” Aldridge issued a memo entitled “Cost-as-an-Independent Variable (CAIV) and Spiral Development Implementation Plans” to each of the Service Acquisition Executives. This memo specifically requests that 100 percent of the Acquisition Category (ACAT) I programs consider incorporating an evolutionary acquisition or spiral development implementation plan by the end of FY02. This memo states that Evolutionary Acquisition (EA) strategies reduce the acquisition cycle by fielding new systems with some, but not all of their ultimate features, as well as adding new technologies in increments as they become available. According to Aldridge (2002), in only rare exceptions would EA not be the best strategy. In those cases, an explanation of why, and what alternative steps are being taken to reduce the cycle time would be necessary (Aldridge 2002).

In his address to the U.S. House of Representatives Subcommittee on Defense House Appropriations Committee March 13, 2002, Secretary Aldridge set forth the plan to reduce cycle times in weapons systems with the use of evolutionary acquisition and spiral development in order to provide military capability to the warfighter faster. According to Secretary Aldridge providing such capability faster is absolutely critical to transformation. Evolutionary acquisition and spiral development will be the linchpins for developing and fielding mature technologies faster for both hardware and software (Subcommittee on Defense House Appropriations Committee 2002:4-5). This address set evolutionary acquisition and spiral development as transformation cornerstones.

Subsequently, on June 04, 2002, Dr. Marvin Sambur, Assistant Secretary of the Air Force (Acquisition) issued a follow-up policy memorandum entitled, “Reality-based Acquisition System Policy for all Programs”. Specifically, this memo states that the primary mission of our acquisition system is to rapidly deliver to the warfighters affordable, sustainable capability that meets their expectations. All actions by any leader, staff, or supporting organizations will support this mission. Dr. Sambur established Evolutionary Acquisition (EA) as the preferred acquisition strategy for achieving this mission. Spiral development is the preferred process to execute the EA strategy (Assistant Secretary of the Air Force, Acquisition 2002).

The Reality-based Acquisition System policy memorandum also establishes two overarching policy objectives: 1) shortening the acquisition cycle time and, 2) gaining credibility within and outside the acquisition community. According to Dr. Sambur’s memorandum, the old acquisition policy was highly prescriptive, while the new policy challenges acquisition program managers to find better ways of doing business without

telling them exactly what to do. Every action taken by individuals responsible for program execution must map directly to, and further these two primary objectives. Members at all levels of the acquisition workforce are expected to seek innovative ways to achieve these objectives (Assistant Secretary of the Air Force, Acquisition 2002). General Lyles, Air Force Materiel Command (AFMC) Commander, further emphasized that Air Force acquisition personnel needed to get out of the checklist mentality and eliminate from our processes all the steps that add time but are of little value (Lyles 2002). Contracting processes must therefore be tailored and linked to achieving these objectives.

The push to deliver an initial capability less capable than the total warfighter requirement is contrary to traditional acquisition practices. In the past, weapons systems were developed based upon current and future technologies as well as perceived threat environments. Traditional acquisition strategies took a number of years and did not deliver any capability until design, manufacture, and test was completed for the entire system. Under EA, a supportable initial increment with the ability to insert new technology or additional capability is rapidly acquired and sustained. A modular, open systems approach is developed that addresses how this initial increment fits into the overall system architecture based upon what is known today. This architecture evolves as both technology and threat environments change.

Purpose

EA strategies may create unique contracting challenges and require innovative business management solutions. Some acquisition professionals have implemented “EA-like” strategies in the past, while many others are experiencing challenges implementing this latest direction. Discussions with these professionals may lead to codification of lessons learned into a process where information can be shared with others through education. This research formulates the basis for a contracting specific lesson in EA that ultimately shares the challenges and best solutions with the contracting community.

Research Questions

I chose to explore the following research questions in order to identify the unique contracting challenges created through implementation of the EA edict:

1. What are the actual and perceived regulatory and procedural roadblocks that are a result of the implementation of an EA strategy?
2. What innovative solutions are being implemented that minimize the effects of these challenges?
3. What contracting/business arrangements best support implementation of evolutionary acquisition?

Although the purpose of this study does not include preparing a comprehensive roadmap for contracting in an EA environment, examples of successful contracting arrangements are included based upon the input received from the above questions.

Scope

The Air Force Materiel Command (AFMC) is comprised of three Systems Centers with distinct system acquisition missions. The Aeronautical Systems Center (ASC) at Wright-Patterson AFB, Ohio focuses on aircraft and airframes. The Air Armament Center (AAC) at Eglin AFB, Florida procures munitions and related equipment. The Electronic Systems Center (ESC) acquires sensors, radar, command, control, communication and other electronic systems. Although, the results of this study may have implications to other commands in the Air Force and the Department of Defense (DoD), a review of each separate command and service would require a greater amount of time than is available for this research. In order to provide a thorough examination of the research questions, this study is limited to assessing the contracting practices of programs in AFMC actively engaged in implementing the EA edict. This research will investigate the most pressing contracting challenges with EA and the proposed solutions for overcoming these challenges as appropriate.

As previously mentioned, EA has been mandated as the acquisition strategy for all ACAT I programs. No firm contracting guidance has been provided on how to accomplish this task either at the DoD or the individual service level. This study answered the research questions as they applied to the three individual Centers and their unique missions to provide a basis of understanding for the larger audience. Both military and civilian contracting officers involved in EA-like programs participated in this study. The results of this study should not be taken as an exhaustive checklist for EA to be rigidly followed but rather as a compilation of current practice that has produced promising results in their given context.

This study will serve as an investigation into the challenges faced by contracting professionals in employing the concepts of evolutionary acquisition. It will provide best approach examples that may be applied by contracting officers in systems level environments for meeting the objectives of evolutionary acquisition. It will also provide the basis for an EA training lesson specifically tailored to the systems level contracting professional.

II. Literature Review

Introduction

This chapter discusses the relevant literature reviewed for the purpose of this study.

First, the traditional acquisition process is reviewed. Second, the basic tenants of evolutionary acquisition are described. Third, a brief overview of the funding process is presented. Fourth, the traditional contracting methods are discussed. Finally, the chapter is wrapped up with an examination of the types of contract arrangements that may aid in the implementation of an EA strategy.

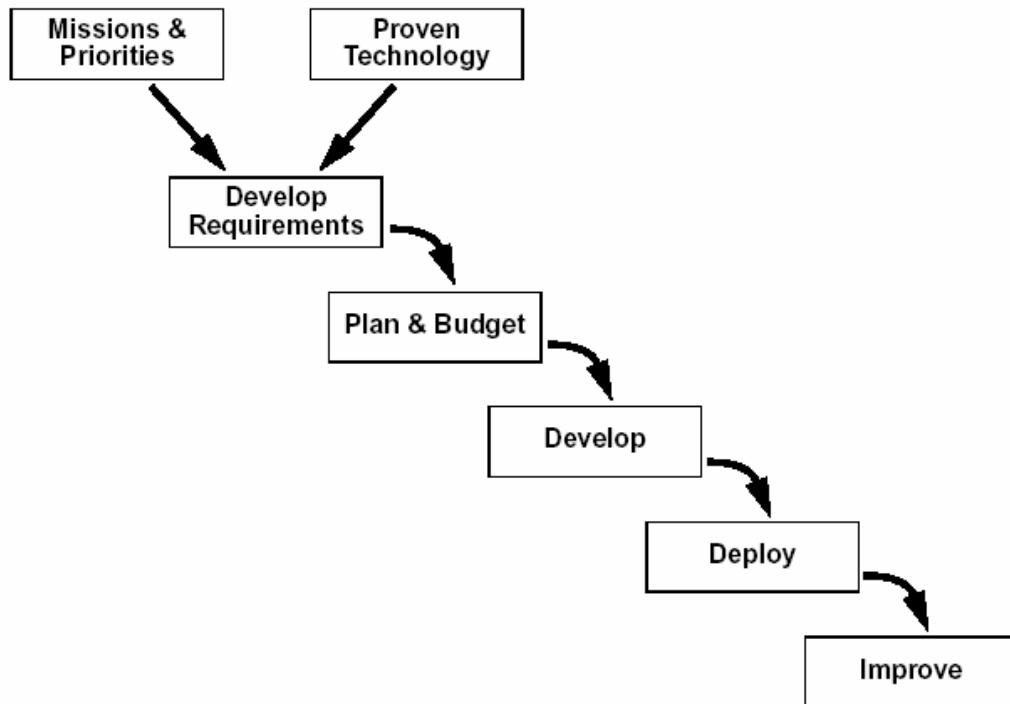
Traditional Acquisition Process

The Department of Defense's (DoD) acquisition process is deeply rooted in the threat environment of the Cold War. Weapons systems were designed, tested and produced to respond to a specific known threat, the Soviet Union. The Post-Cold War era poses a new set of political, economic, and military security challenges for the United States: regional or limited conflicts; proliferation of weapons of mass destruction, both nuclear and non-nuclear; risk to its economic well-being; and the possible failure of democratic reform in the former Soviet Bloc and elsewhere (Perry 1994). The Department of Defense's (DoD) Bottom-Up Review in 1993 provided the vision, and the blueprint, for meeting the security challenges of the post-Cold War world -- responding to threats anywhere in the world where U.S. interests are at risk. In today's environment the current process will not always be able to meet the Department's need. DoD will not be able to carry out this blueprint, without dramatic changes in its acquisition processes – from determining what the Department needs, to logistics support and reutilization requirements (Perry 1994).

The detailed procedures required by the traditional process are considered overly prescriptive and do not constitute an acquisition policy environment that fosters efficiency, creativity, and innovation (Deputy Secretary of Defense 2002). Traditional acquisition strategies have taken 10 to 15 years and did not deliver capability until design, manufacture, and test was completed for the entire system. This extended acquisition time routinely results in a technology or weapons systems reaching obsolescence before reaching the field (Colarusso 2002).

The DoD traditional acquisition process employs a step-by-step approach that develops, tests, refines, produces and deploys a system in a linear fashion based upon existing and future technologies. It is essentially a serial process where the completion of an activity triggers a handoff to the subsequent activity (Colarusso 2002). Under the traditional fixed, one-step, requirement approach, military planners prepare a complete list of attributes for the system to include lethality, range, speed, payload and mobility. Service acquisition officials then use the list to call for bids from defense firms, choose a contractor, develop the system, conduct tests and buy completed systems for deployment (Ratnam 2002). Contracts are usually awarded competitively covering a single system on the basis of a complete defined requirement. This approach has been deemed the “waterfall approach”, commonly illustrated as an irreversible flow down a series of steps, from the original determination of objectives and requirements to the production software that emerges at the bottom. The waterfall approach can be appropriate when the requirements and development challenges are clearly understood but it can be disastrous to commit to requirements up front, before their impact is clear (Carr and Cone 2002).

The waterfall model, as presented at the 2000 Software Engineering Institute Workshop, is depicted in Figure 2-1 (Rothenberg 2000).



Source: Rothenberg Briefing to SEI Workshop
September 2000

Figure 2-1 The Waterfall Model

Under the waterfall model, existing and projected threats and technology merge to develop the requirements. This set of requirements then triggers the planning and budget-planning phase. Once the planning and budgeting phase is complete and the program is funded, a contract is awarded and the contractor begins development and testing for the entire system. After the entire system passes the required tests, the contractor begins production and delivers the weapon system to the warfighter (Rothenberg 2000).

Through operational use, desired capabilities are discovered which may trigger the process to improve the system through modifications and block upgrades. Three of the

processes used to improve the system will be discussed further: block upgrades, pre-planned product improvements (P3I), and engineering change proposals.

Block upgrades permit significant technology advances in major weapon systems. The block upgrade process is a technique that is used on major weapon systems to introduce multiple product improvement changes on a periodic basis. On the C-17 program, this is called an annual configuration update, although there is discussion on lengthening the block process to once every two years (Pike 2002). Under the block upgrade concept, all products within a given block have essentially the same configuration. This results in reduced sustainment costs by minimizing unique spare, tech order, support equipment, and training requirements. Stable configurations within a block of aircraft or products improve manufacturing efficiency and quality. Diligent manufacturing development and transition planning is required to minimize production line disruptions when introducing a new block with configuration changes (Pike, July 2002).

Pre-Planned Product Improvement, often referred to as P3I, is an appropriate strategy when requirements are known and firm, but where constraints (typically either technology or budget) make some portion of the system unachievable within the schedule required. If it is concluded that a militarily useful capability can be fielded as an interim solution while the portion yet to be proceeds through development, then P3I is appropriate. The approach generally is to handle the improvement as a separate, parallel development; initially test and deliver the system without the improvement; and prove and provide the enhanced capability as it becomes available. The key to a successful P3I is the establishment of well-defined interface requirements for the system and the

improvement. Use of a P3I will tend to increase initial cost, configuration management activity, and technical complexity (Defense Systems Management College 2000). P3I detailed planning is usually conducted during the Engineering and Manufacturing Development (EMD) phase and includes programming resources to accomplish an orderly and cost-effective upgrade of a system's capability after fielding. The whole idea is to sacrifice some initial system capability in order to get a good system fielded in a timely manner, and then facilitate system upgrade(s) through timely advanced planning and funding.

Engineering Change Proposals (ECPs) are proposals to the responsible authority recommending that a change to an original item of equipment be considered, and the design or engineering change be incorporated into the article to modify, add to, delete, or supersede original parts (Defense Systems Management College 2001). The ECP, as typically used in the DoD, makes a change to a contract that is out of scope of the existing requirements. Engineering Change Proposals (ECP) identify need for a permanent configuration change. Upon approval of an ECP, a new configuration is established. These changes can result from problems with the baseline requirement, safety, interfaces, operating/servicing capability, preset adjustments, and human interface including skill level, or training. The ECP can also be used to upgrade already delivered systems to the new configuration through use of retrofit, modification kits, and the like (Defense Systems Management College 2001).

Block upgrades, P3I, and ECPs did provide additional capability and permitted technology insertion over time under the traditional acquisition process. Prior experience with system acquisition has shown that conventional acquisition strategies often led to



unsatisfactory results (Defense Systems Management College 1998). The principal difficulty with traditional acquisition activities has been that the time required to complete the entire process has lagged well behind changes in requirements and in capabilities provided by technology advances. Environmental changes within which acquisition takes place may have exacerbated previous difficulties in maintaining currency, both in military capability available and in technology used to provide it (Defense Systems Management College 1998).

DoD's traditional acquisition practices place a tremendous burden on the contractor (Aldridge 2002). These processes require that the DOD and industry engage in a lengthy, expensive, and often futile pantomime by which the cost to the government of a product was evaluated, estimated, and then negotiated, often at the expense of the industry. So burdensome have been the requirements of cost-based pricing, that often only the largest defense contractors – those with large legal and accounting offices – choose to compete (Aldridge 2002). The portion of U.S. industry devoted specifically to serving Defense needs has been shrinking rapidly from over 15 major defense contractors in 1985 to less than 5 in 2002. By 1995 only three major U.S. industrial entities remained capable of producing complete weapon systems (Defense Systems Management College Press 1998). As the defense industrial base shrank, the acquisition cycle times for all services have steadily increased over time. Figure 2-2 shows the respective acquisition cycle time increases.

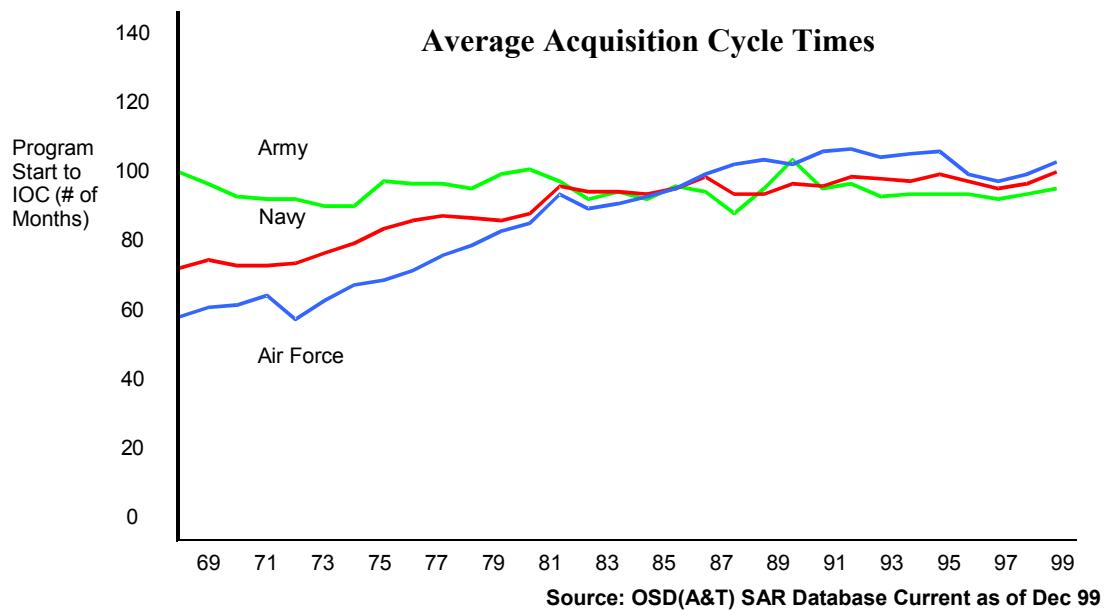


Figure 2-2 Average Acquisition Cycle Times

Based upon the results of the traditional acquisition system and the rapidly changing technology and threat environments, the need for a more flexible and responsive acquisition process emerged. Systems can no longer be allowed to languish in the pipeline until every possible bell and whistle has been hung on the frame. Programs will now require the use of commercial, mature technology where possible to speed development, while reducing costs and risk (Aldridge 2002). The new process must be able to capture and incorporate existing and emerging technology while being flexible enough to meet the changing threat environment of today. In response to these needs, DoD employed the concepts of evolutionary acquisition.

Evolutionary Acquisition Process

Evolutionary Acquisition (EA) and spiral development produce and deploy systems based on mature technologies. Evolutionary acquisition is defined as an acquisition

strategy that defines, develops, produces or acquires, and fields an initial hardware or software increment (or block) of operational capability (USD AT&L 12 April 2002). EA is based on technologies demonstrated in the relevant environments, time-phased requirements, and demonstrated manufacturing or software deployment capabilities. These capabilities can be provided in a shorter period of time, followed by subsequent increments of capability over time that accommodate improved technology and allow full and adaptable systems over time (USD AT&L 12 April 2002). The objective is to deliver this incremental capability in 18 months or less. More than one increment may occur at a given time. The lack of specificity and detail in identifying the final system capability distinguishes EA from other incremental strategies. The system architecture defines the partitioning of system components, flow of data, flow control, timing, and throughput relationships, interface layering and protocol standards. A flexible architecture requires long-term tolerance to change (Draft Evolutionary Acquisition Guide, 2002).

The result of an EA strategy will be a system that evolves incrementally toward fulfilling its desired end-state with the flexibility to refine requirements and exploit opportunities as they arise. The first increment of capability will meet many, but not all, of the system's desired operational requirements. Subsequent increments will incorporate new technologies that have matured during the development and production of previous increments. The Global Hawk and Predator unmanned air vehicles have been used with great success in Afghanistan. These systems are good examples of initial increments that will have increasing capability as technology improves (Senate Armed Services Committee 2002). According to Secretary Aldridge in an April 2002 memo, EA and

spiral development processes are the “preferred” approach within the acquisition process (USD AT&L 12 April 2002).

The simple goal of an EA strategy is to deliver today’s technology to the warfighter efficiently and quickly. The intent of a Spiral Development process is to get systems to the users sooner, cheaper and at less risk. Use of an EA strategy will deliver a core operational capability sooner by dividing a large, complex, single development effort into many smaller developments or increments. EA allows systems to be deployed even though they might not include every technology or capability that might possibly be needed. EA permits a program to quickly respond to changing conditions by allowing each increment to accommodate the following three activities: 1) develop new capabilities supporting the operational requirements and goals of the system, 2) exploit opportunities to insert new technologies that reduce cost of ownership or accelerate fielding of new capabilities resulting from experimentation or technology demonstrations, and 3) refine current capabilities based on user feedback, testing, or experimentation (AFI 63-123:3.2).

Evolutionary acquisition and spiral development will enable us to maximize benefits from increased Science and Technology funding by providing available transformational technologies to the warfighter much faster. Evolutionary acquisition differs from a Pre-Planned Product Improvement (P3I) acquisition strategy in that future increments are not definitively planned and baselined until the current increment is about to be executed (AFI 63-123:3.1). Systems managed via spiral development will not be allowed to languish in the pipeline until every possible bell and whistle has been hung on the frame. Programs will now require the use of commercial, demonstrated technology where

possible to speed development, while reducing costs and risk. Those systems will however, be able to accommodate the new capabilities when circumstances call for it, or technology makes it possible (Aldridge 2002).

Implementing the EA strategy requires tailoring of the traditional acquisition milestones and phases in DoD 5000.2-R in order to accomplish program goals. To successfully apply EA, several programmatic characteristics are deemed necessary. These characteristics include a general description of the desired end-state capabilities of the system, a concise operational concept of the full system, a flexible architecture that accommodates change and incremental development and deployment, early definition, funding, development, testing, fielding, supporting and operational evaluation of the first increment capability followed later by the same for follow-on increments of operational capability, and continual dialogue and feedback among users, developers, supporters and testers (Draft Evolutionary Acquisition Guide 2002).

The traditional and evolutionary acquisition processes strive to deliver additional capabilities in response to the warfighter's needs. While these processes differ in the acquisition approach taken, both tradition and evolutionary acquisition processes are dependent on the funding and budget process.

Funding and the Budget Process

The funding and budget process for the entire defense department is regulated by the Planning, Programming, and Budgeting System (PPBS). The PPBS coordinates planning efforts at the national level of the civilian and military organization. The process translates force requirements developed by the military into budgetary requirements that

are then presented to Congress (Naval Post Graduate School 2003).

The purpose of the PPBS is to produce a plan, a program, and, finally, a budget for the Department of Defense. The budget is forwarded in summary to the President for his approval. The President's budget then is submitted to Congress for authorization and appropriation.

PPBS is a complicated, arduous and heavily regulated process that requires significant effort on the part of weapon systems planners to secure funding for their respective programs. It is recognized that the PPBS process creates certain challenges in the acquisition community that cannot be easily overcome due to statutory and regulatory requirements.

A thorough analysis and explanation of the PPBS process is beyond the scope of this research; however an understanding of the process may prove beneficial to the reader. The Naval Post Graduate School's Financial Management in the Armed Forces website at <http://pcc.nps.navy.mil/PPBS/ppbs.html> provides a comprehensive overview of the PPBS process. Additional information may be obtained in DoD Instruction 7045.7 "Implementation of the Planning, Programming, and Budgeting System (PPBS)". Suggestion for funding in an EA environment may differ from traditional methods due to its incremental approach. Suggestions for funding an EA program can be found in AFI 63-123 *Evolutionary Acquisition for C2 Systems* Section 4.4.2 as well as in the Draft Evolutionary Acquisition Guide Chapter 4.

Traditional Contracting

An important part of any acquisition strategy is determining the contracting strategy. FAR Part 16.104 provides specific factors that the contracting officer should consider in determining the contracting strategy. These factors include price competition, price analysis, type and complexity of the requirement, urgency of the requirement, period of performance or length of the production run, contractor's technical capability and financial responsibility, adequacy of the contractor's accounting system, concurrent contracts, the extent and nature of the proposed subcontracting and the acquisition history.

Under current FAR guidance, the contracting officer may select from two contract types: cost reimbursement and fixed price. Variations of each type are available to fit the requirements of an acquisition. These contract types may be combined to form hybrid contracts that have different contract types associated with individual contract line items (CLINS). A discussion of each contract type and their associated variations is provided below.

Contract Types

Fixed-Price Contracts. Fixed-price types of contracts provide for a firm price or, in specific circumstances an adjustable price. Fixed-price contracts providing for an adjustable price may include a ceiling price, a target price (including target cost), or both. Unless otherwise specified in the contract, the ceiling price or target price is subject to adjustment only by operation of contract clauses providing for equitable adjustment or other revision of the contract price under stated circumstances. The contracting officer shall use firm-fixed-price or fixed-price with economic price adjustment contracts when

acquiring commercial items (FAR 16.201). A complete description of the different types of fixed-price contract types can be found in Appendix C.

Cost Type Contracts. Cost-reimbursement types of contracts provide for payment of allowable incurred costs, to the extent prescribed in the contract. These contracts establish an estimate of total cost for the purpose of obligating funds and establishing a ceiling that the contractor may not exceed (except at its own risk) without the approval of the contracting officer (FAR 16.301-1). Cost-reimbursement contracts are suitable for use only when uncertainties involved in contract performance do not permit costs to be estimated with sufficient accuracy to use any type of fixed-price contract. A cost type contract may only be used when the contractor's accounting system is able to track applicable costs and the Government can provide the appropriate surveillance to ensure that efficient cost and performance methods are utilized during performance. Cost-type contracts cannot be utilized when acquiring commercial items (FAR 16.301-3). A complete description of cost contract types is also provided in Appendix C.

Indefinite Delivery Contracts. There are three types of indefinite-delivery contracts: definite-quantity contracts, requirements contracts, and indefinite-quantity contracts. The indefinite-delivery contract may be used to acquire supplies and/or services when the exact times and/or exact quantities of future deliveries are not known at the time of contract award.

The various types of indefinite-delivery contracts offer advantages. All three types permit Government stocks to be maintained at minimum levels and direct shipment to users. Indefinite-quantity contracts and requirements contracts also permit flexibility in both quantities and delivery scheduling; and ordering of supplies or services after

requirements materialize. Indefinite-quantity contracts limit the Government's obligation to the minimum quantity specified in the contract. Requirements contracts may permit faster deliveries when production lead time is involved, because contractors are usually willing to maintain limited stocks when the Government will obtain all of its actual purchase requirements from the contractor. Indefinite-delivery contracts may provide for any appropriate cost or pricing arrangement under FAR Part 16. Cost or pricing arrangements that provide for an estimated quantity of supplies or services (*e.g.*, estimated number of labor hours) must comply with the appropriate procedures of this subpart (FAR 16.501.2). A complete description of indefinite delivery type contracts is provided in Appendix C.

Other Contract Types. In certain instances it may be beneficial to utilize time-and-materials, labor-hour, or letter contracts. These types provide the degree of flexibility necessary to acquire supplies and services under unusual circumstances. A complete description of these contract types is provided in Appendix C.

Business Arrangements

Other tools are also available to the contracting professional in the acquisition process. Two such tools are agreements and Other Transaction Authority (OTA). A discussion of each of these tools is provided in the following paragraphs.

Agreements. Agreements allow the contracting officer to establish and negotiate contract language that may be incorporated into more than one contract. Three agreement types apply to the acquisition of major systems: basic agreements, basic ordering agreements, and forward pricing rate agreements.

Basic Agreements. A basic agreement is a written instrument of understanding, negotiated between an agency or contracting activity and a contractor, that contains contract clauses applying to future contracts between the parties during its term and contemplates separate future contracts that will incorporate by reference or attachment the required and applicable clauses agreed upon in the basic agreement. A basic agreement is not a contract. A basic agreement should be used when a substantial number of separate contracts may be awarded to a contractor during a particular period and significant recurring negotiating problems have been experienced with the contractor. Basic agreements may be used with negotiated fixed-price or cost-reimbursement contracts (FAR 16.702).

Basic Ordering Agreement. A basic ordering agreement is a written instrument of understanding, negotiated between an agency, contracting activity, or contracting office and a contractor, that contains terms and clauses applying to future contracts (orders) between the parties during its term, a description, as specific as practicable, of supplies or services to be provided, and methods for pricing, issuing, and delivering future orders under the basic ordering agreement. A basic ordering agreement is not a contract. A basic ordering agreement may be used to expedite contracting for uncertain requirements for supplies or services when specific items, quantities, and prices are not known at the time the agreement is executed, but a substantial number of requirements for the type of supplies or services covered by the agreement are anticipated to be purchased from the contractor (FAR 16.703).

Forward Pricing Rate Agreement. When cost or pricing data are required, offerors are required to describe any forward pricing rate agreements (FPRA's) in each specific

pricing proposal to which the rates apply and to identify the latest cost or pricing data already submitted in accordance with the agreement. All data submitted in connection with the agreement, updated as necessary, form a part of the total data that the offeror certifies to be accurate, complete, and current at the time of agreement on price for an initial contract or for a contract modification. Contracting officers will use FPRA rates as bases for pricing all contracts, modifications, and other contractual actions to be performed during the period covered by the agreement (FAR 15.407-3).

Other Transaction Authority (OTA). Other transactions is a term commonly used to refer to transactions other than contracts, grants or cooperative agreements that are entered into under the authority of 10 U.S.C. 2371. OTA provides tremendous flexibility to negotiate terms and conditions, as other transactions are not required to comply with the Federal Acquisition Regulation (FAR), its supplements, or laws that are limited in applicability to contracts, grants or cooperative agreements.

The Department of Defense has temporary authority to award other transactions for certain prototype projects that are directly relevant to weapons or weapon systems proposed to be acquired or developed by the Department of Defense. This type of other transaction is often referred to as a "Section 845 OT" because Section 845 of the National Defense Authorization Act for Fiscal Year 1994 (Public Law 103-160) initially authorized its use.

Prototype projects could include prototypes of weapon systems, subsystems, components, or technology. With regard to Section 845 authority, a prototype can generally be described as a physical or virtual model used to evaluate the technical or manufacturing feasibility or military utility of a particular technology or process, concept,

end item, or system. The quantity developed should be limited to that needed to prove technical or manufacturing feasibility or evaluate military utility. In general, Research, Development, Test & Evaluation (RDT&E) appropriations will be appropriate for other transaction prototype projects. Low Rate Initial Production quantities are not authorized to be acquired under prototype authority (Other Transactions Guide 2000).

Evolutionary Acquisition Contracting

Sparse guidance is available concerning the best contracting strategy in an EA environment. The appropriate contracting strategy depends on the particular requirement. Both AFI 63-123 and the Draft Evolutionary Acquisition Guide recommend considering modular contracting in accordance with FAR Part 39.103. Specifically 39.103(d) states for each increment, contracting officers shall choose an appropriate contracting technique that facilitates the acquisition of subsequent increments. Pursuant to Parts 16 and 17 of the Federal Acquisition Regulation, contracting officers shall select the contract type and method appropriate to the circumstances (*e.g.*, indefinite delivery, indefinite quantity contracts, single contract with options, successive contracts, multiple awards, task order contracts). Each increment shall be contracted for separately and not obligate the Government to purchase any increments beyond the initial capability.

Modular contracting breaks large acquisitions into smaller, more manageable modules or in the case of EA, increments. Complex requirements can be addressed incrementally in order to enhance the likelihood of achieving workable solutions today while allowing for subsequent modules to take advantage of technological changes. Risk can be handled incrementally, thereby making it easier to manage. As technology or threats change, the

subsequent modules can be adjusted or modified to accommodate those changes. There is no significant difference in the procurement techniques used between the “traditional” method of contracting and the concept of modular contracting (Draft Evolutionary Acquisition Guide 2000:50).

When appropriate, other nontraditional contracting approaches can be used to further enhance efficient and effective development efforts. Other nontraditional contracting approaches include Cooperative Research and Development Agreements (CRDA) under the Domestic Technology Transfer program (AFPD 61-3) and “other transactions” (non-FAR contracts) authorized for certain Air Force research and prototype projects under Section 845 of the FY 94 National Authorization Act, as amended by Section 804 of the FY 97 National Defense Authorization Act. Quick and efficient implementation of the selected contracting approach is key to successful execution of each spiral development increment within the goal of 18 months or less. (AFI 63-123: 4.4.1)

Summary

Based on a review of relevant literature, I developed some preliminary conclusions regarding the business arrangements and contractual documents necessary to implement an EA strategy.

The primary purpose of the evolutionary acquisition process is to provide initial capability to the warfighter in less time while enabling the insertion of technology over time. No specific direction concerning contracting in an evolutionary acquisition environment has been provided to the contracting community, only general guidance as that found in AFI 63-123 and the Draft Evolutionary Acquisition Guide.

The Federal Acquisition Regulation provides the contracting professional a variety of tools and contractual arrangements to acquire weapons systems while also permitting a great deal of flexibility in the use of these instruments. Each of the contract and agreement types were reviewed and synopsized. Neither the relevant literature nor the regulatory guidance concerning EA, revealed new tools or contractual arrangements. The creativity of the contracting professional may determine the best contractual arrangement for a given acquisition. A compilation of currently employed evolutionary acquisition practices may prove of additional use.

The next chapter will describe the methodology used to discover the contracting strategies currently being implemented in an evolutionary acquisition environment.

III. Methodology

Overview

This chapter describes the methodology applied to acquire the necessary data for examination in this study. In contrast to some research methods, the techniques utilized in this research were not for the purpose of analyzing data, but rather for the creation and collection of the original data necessary to explore the contracting challenges associated with EA implementation. This chapter establishes why this methodology was selected and also reviews the principals and pitfalls with its implementation. The chapter concludes with a description of the research design.

Basis

With the mandatory implementation of Evolutionary Acquisition (EA) procedures in Department of Defense (DoD) Acquisition Programs, a new way of doing business has been established for acquiring weapon systems. Core capabilities of weapon systems must now be acquired rapidly while simultaneously planning for additional capabilities that will be added as technology evolves. While this concept provides new capabilities to the war fighter more rapidly than the traditional acquisition procedures, it also creates new challenges for contracting personnel.

The contracting challenges associated with the implementation of Evolutionary Acquisition procedures are difficult to assess through traditional statistical manipulation or measurement techniques. To discover these challenges, it was necessary to look

beyond mere financial data, contract files and metrics. This study was more interested in identifying the contracting challenges associated with implementing EA and how contracting personnel are meeting these challenges. In order to achieve these goals, it was necessary to rely on the data provided through the professional judgment, experience, and opinion of contracting professionals.

Opinion is defined as the vast amount of information that lies between speculation and knowledge based upon some evidence but not fact (Elsbernd 1974:7). Because opinion is imperfect, fragmentary, and incomplete information, it is characterized by a broad range of diversity among individuals (Elsbernd 1974:7). Consequently, judgments based upon opinion will also vary considerably between different individuals (Dalkey 1967:2).

There is little correlation between verbosity and knowledge of the subject matter under consideration (Uhl 1983). Even though anyone with a basic understanding of a subject can provide opinion and discussion on a matter, this study required professional experience and judgment concerning contracting for major acquisition programs. Since this is the case, the discussion necessary to generate the data required was conducted utilizing experts in the contracting field, specifically those involved in Air Force Materiel Command “pathfinder” designated and “EA-like” programs. The selection criteria of these individuals will be discussed in detail later in this chapter.

In a situation where there are no historical records available, as is the case in implementing the new EA processes, the obvious recourse is the efficient use of intuition and judgment of a group of persons who are keen observers and have extensive experience and knowledge in the subject area (Brown 1968:14). Rather than collecting individual assessments and comparing data, as in a case study methodology, panel

members prepared their positions based upon the fact they may have to defend their position against opposing opinions of other contracting professionals in future rounds.

The approach adds validity to the responses gained during each discussion. The Delphi technique is quite clever. Regardless of how high up the ladder you may think you are, you are still forced to back up your position rather than rest on your laurels (Armstrong 1989).

Even though it is realized that input of multiple experts should produce a superior result, the possibility exists for disagreement within the group. This possibility requires the consolidation of inputs to achieve a group opinion. Although the results from a group of experts can yield substantive and thought-provoking results, they may not be an exhaustive nor all inclusive set of ideas. A study may yield a valuable source of information; however, the value of the information is for the individual reader to decide and is limited due to the constraints imposed by the panel selection, as well as the backgrounds, experiences and biases of each member (Clayton 1997: 377).

Within the Department of Defense, group opinion is usually accomplished through utilization of an Integrated Product Team (IPT), however; this could be better classified as a compromise due to group pressure rather than the consensus required for this study. Group discussion, while appearing to be problem-oriented is often irrelevant or biased, as it is usually more concerned with individual or group interests than with problem solving (Uhl 1983). In lieu of this, an alternative approach, the Delphi technique was employed.

The Delphi Method

Delphi is the name that has been applied to a technique designed to elicit opinions from a group with the aim of generating a group response. Delphi replaces direct confrontation and debate by a carefully planned, anonymous, and orderly program of sequential individual interrogations usually conducted by questionnaires. The series of questionnaires is interspersed with feedback derived from the respondents (Brown et. al. 1969:1). Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem (Clayton 1997: 375).

The Delphi method was originally devised “in order to obtain the most reliable opinion consensus of a group of experts by subjecting them to a series of questionnaires in depth interspersed with controlled opinion feedback” (Dalkey and Helmer 1962: v). Delphi was developed in the 1950’s during an Air Force sponsored study at The RAND Corporation to apply expert opinion in determining the number of atomic bombs needed by the Soviets to reduce U.S. munitions output by a certain quantity (Dalkey and Helmer 1962: 1). The method was initially discounted to provide only event predictions, however since its inception it has been used for a variety of situations to evaluate relationships, options or any other situation requiring subjective judgment (Linstone and Turhoff, 1975: 4).

The uses of Delphi, to supply soft data in the social sciences and to provide decision makers with ready access to specialized expertise, are of great potential importance (Linstone & Turhoff 1975:xx). The Delphi procedure is one of the most efficient methods for uncovering the implicit models that lie behind the opinions in the soft areas (Dalkey

1967:9). Evidence is mounting that systematic processing of expert opinion can produce significant improvements both in accuracy and reliability (Dalkey 1967:8). If the objective is the identification of content based on expert consensus, as is the case for this study, then the Delphi technique is an appropriate choice as it may enhance the significant contributions of the panel (Clayton 1997: 377). Judgmental forecasting remains the dominant form of analysis employed not only by the financial community, but also throughout the corporate planning rooms around the world (Armstrong 1989).

Moore (1987 p 15-17) provides four reasons why using a group of people rather than an individual is more desirable in conducting applied social research: it is logical that if you properly combine the judgment of a large number of people, you have a better chance of getting closer to the truth, it is desirable to use groups in order to understand social phenomena by obtaining the views of the actors, it is often beneficial to use groups if you are concerned about the consequences of your research, and if your goal is to solve a problem of a particular group, it is reasonable to believe that the group is more likely to accept your advice (or research findings) if they have participated in the research process. Complex, ill-defined problems often can be addressed only by pooled intelligence.

With Delphi, members of a group are questioned anonymously (in this case via e-mail) several times. Between rounds of questioning, a summary of the group response is provided to each individual to stimulate further thinking. Summaries of the group's comments on previous rounds may also be provided (Elsbernd 1974:1).

Under Delphi, there is no prescribed format for study conduction. Delphi collects and organizes judgments in a systematic fashion. This technique gains input, establishes priorities and builds consensus. Delphi organizes and helps focus dissent, turning this

group effect into a window of opportunity. In short, Delphi cannot be overlooked as a useful and potent tool when attempting to harness expert opinion for critical decision-making tasks (Clayton 1997: 377). The characteristics of the Delphi technique are intended to overcome the drawbacks of conventionally structured groups such as the influence of the dominant individual, noise, and the group pressure for conformity (Elsbernd 1974:25). Throughout the literature on Delphi, there are three common features: anonymity of panel members, iteration and controlled feedback, and statistical group response (Dalkey 1969:16, Dalkey 1967:3, and Spinelli 1983:73).

The first common feature, anonymity of panel members, must be protected. Anonymity means that a participant's response and arguments are known only to the administrator of the group and are not attributed to the individual. Anonymity eliminates the influence of the dominant individual and reduces both noise and the pressure for conformity (Elsbernd 1974: 25). This mode of controlled interaction among the respondents represents a deliberate attempt to avoid the disadvantages associated with more conventional use of experts, such as round-table discussions or other milder forms of confrontation with opposing views (Dalkey and Helmer 1962: 2).

According to Dalkey, the Delphi method appears to be more conducive to independent thought on the part of the experts and to aid them in gradual formation of a considered opinion while reducing the effect of the dominant individual (Elsbernd 1974:26, Dalkey 1967:3). Spinelli adds that Delphi provides the opportunities for dissident respondents to voice their opinions or disagreements in a reasonably unthreatening, non-face-to-face environment (Spinelli 1983:73).

Direct confrontation, on the other hand, all too often induces the hasty formation of preconceived notions, an inclination to close one's mind to novel ideas, a tendency to defend a stand once taken or, alternatively and sometimes alternately, a predisposition to be swayed by persuasively stated opinions of others (Dalkey and Helmer 1962: 2).

Although pressure for conformity still operates with Delphi, this pressure is reduced to an internal and individual pressure (Elsbernd 1974:27).

Utilizing the Delphi technique in the past has found that the best ideas did not always surface from the most experienced member of the team. As for those individuals who were perceived to be the best according to reputation—they were forced to support or conform. In an open group, the most experienced member would rarely be challenged due to their reputation and stature (Armstrong 1989: 2).

The second common Delphi feature, controlled feedback, is a technique for eliminating extraneous material and consolidating group responses by conducting iterations of discussion separated by a summary of the previous session inputs (Dalkey, 1969: 16). Controlled feedback is a device to reduce noise and allows the researcher to control the information given to the panel (Dalkey 1967:3). By systematically exploring the factors which influence the judgment of the individual expert, it becomes possible to correct any misconceptions that he may have harbored regarding empirical facts or theoretical assumptions underlying those factors, and to draw his attention to other factors which he may have overlooked in his first analysis of the situation (Dalkey 1962: 3). A skillful administrator removes all evidences of status, verbosity, emotionalism, and pure speculation before feeding back the arguments (Elsbernd 1974:25). The purpose of

feedback is to provide new information and to cause rethinking of the problem (Elsbernd 1974:27).

Finally, the third common Delphi feature, statistical group response, grants the researcher the assurance that each respondent's input is present in the final response and reduces the pressure of group conformity by revealing the spread between varying options (Dalkey 1969: 16). Statistical group response is used primarily to arrive at a consensus while preventing group pressure for conformity (Elsbernd 1974:27).

Most studies require multiple iterations in order to reach a relevant group opinion. The extent of the research problem will determine the number of iterations necessary for a particular study. Within these broad guidelines, a large amount of latitude exists, making Delphi flexible and adaptable for use in conjunction with other methods and procedures (Elsbernd 1974:20).

Although Delphi does offer some potential advantages when the use of expert intuitive judgment is appropriate, it is not a panacea and must be used with care (Elsbernd 1974:2). The technique is not without challenges and limitations. Some common problems include the imposition of the researchers views by over specifying the problem and not allowing other views of the problem, assumption that Delphi is the only form of communication necessary for a particular problem, poor summation and interpretation of the group response by the researcher, generation of an artificial group consensus by ignoring disagreements, and underestimation of the demand placed upon respondents by the technique (Linstone and Turhoff 1975:6).

It is possible that the researcher's analysis of the results is not the only interpretation that can be made and that some distortion may occur due to the researcher's own biases

(Clayton 1997: 377). If you question several different “experts” you will get a variety of answers. This creates a problem for the policy maker in determining exactly how to use this opinion. Dalkey warned that the expert’s responses are not always independent since work assignments required some contact between the members. Dalkey also noted that the posing of vague questions in the initial stages of the technique generally invite critical comment of little value to the research (Dalkey and Helmer 1962: 17).

Due to both personal and professional obligations, panel members are often limited to the amount of time each can dedicate to the decision-making process. This may effectively reduce each member’s ability to consider and report on all dimensions under investigation (Clayton 1997: 377). Delphi provides a communication medium whereby individuals can participate without needing to travel to a group meeting place. Further, individuals participate anonymously as a strict requirement of Delphi process. This anonymity substantially reduces the social-emotional behavior often found when using other methods, which allows participants to focus on task-oriented activities (Clayton 1997:374). The selection methodology of panel “experts” has been questioned (Ayers 2002). The selection of experts is an intricate problem even when the category is well defined. Expertness can be judged by status, experience or by a myriad of other things (Brown 1968:4). The Delphi technique has its share of critics. Sackman (1975), one of the most ardent critics of the methodology, raises several concerns related to the scientific nature of the Delphi process.

Although Sackman (p 33) poses several key questions relating to conventional Delphi, the research performed later by Clayton discounted Sackman’s concerns (Clayton 1997, 376). Clayton addressed each of Sackman’s claims against the validity of Delphi. Clayton

determined that Sackman's claims were unwarranted as supported by literature and common sense. The panelists should however possess an extensive knowledge of the subject matter or be familiar with experiential criteria that would allow them to provide valid input. Verifying this knowledge is somewhat difficult. The background and experiences of each panel member, which may directly affect their decision-making, are generally beyond the control of the Delphi study (Clayton 1997, 377).

Though arguments against the scientific validity of the Delphi technique exist, the technique is an innovative way to gather expert judgments on critical issues while mitigating the effects commonly caused by position and group influence. As presented earlier, in a situation where there is no historical records available, the obvious recourse is the efficient use of intuition and judgment of a group of persons who are keen observers and have extensive experience and knowledge in the subject area (Brown 1968:14). It is inevitable that as questions to be answered get broader and more complex, intuition and judgment must supplement quantitative analysis to an increasing extent (Brown 1968:1).

The decision to use the Delphi technique should be based on the purpose or objective of a research study which wishes "to obtain the most reliable consensus of opinion of a group of experts" (Dalkey and Helmer 1962:458). The questions being asked during this study were highly appropriate for Delphi in that they required a large degree of expert opinion since no extensive experience with implementing EA exists. As suggested by Elsbernd, no amount of fact gathering could have conclusively answered the questions posed by this study (Elsbernd 1974:28). Judgmental forecasting remains the dominant

form of analysis employed not only by the financial community, but also throughout the corporate planning rooms around the world (Armstrong 1989).

The principles of the Delphi technique will be employed to develop a research design that effectively gathers the information required for this study. In addition, the data gathered via the Delphi technique will be methodically assessed and theoretically sound. Appropriate measures, such as question panel reviews, will be taken to ensure the discussion is directed in a manner to prevent researcher bias as well as not misrepresent the individual responses of the panel members.

One benefit of utilizing the Delphi technique in this study was the ability of panel members to participate in a discussion over a period of time without any significant impact on their daily work schedules. Delphi provides a communication medium whereby individuals can participate without needing to travel to a group meeting place. Further, individuals participate anonymously as a strict requirement of Delphi process. Anonymity substantially reduces the social-emotional behavior often found when using other methods, which allows participants to focus on task-oriented activities (Clayton 1997:374). This resulted in an increased the level of participation and generation of a more reliable collection of responses.

Since respondents participated via e-mail, they did not have to travel nor attend any formal meetings at a set time. Utilization of e-mail also resulted in a less costly and less intrusive study by providing a high degree of flexibility in the response times without location limitations. In addition, anonymity resulted in a discussion, free of the pressure of conformance that led to a more in depth analysis prior to reaching group consensus.

The avoidance of “group think” provided both candid and in depth individual responses to the posed discussion questions that otherwise may not have been realized.

Research Design

Selecting Experts. Since EA is virtually uncharted territory, no specific criteria exist to identify experts in this field. For the purpose of this research, it became necessary to establish a set of criteria for defining the expert. In concert with the research sponsor, the Air Force Materiel Command Contracting Directorate (AFMC/PK), a list of four criteria was developed: 1) a minimum of five years contracting experience in systems level acquisition programs, 2) currently warranted as a contracting officer, 3) involved in either a SAF/AQ “pathfinder” designated program or a program implementing “EA-like” processes, and 4) available to respond via e-mail from 8 July 2002 through 7 October 2002.

In addition to these minimum criteria, the sponsor also desired individual panel discussions to be conducted at each of the three AFMC Centers to include the Aeronautical Systems Center (ASC), Air Armament Center (AAC), and Electronic Systems Center (ESC). Each Center has unique acquisition missions that might warrant contracting and business arrangements applicable only to their respective situations. The intent of this study is to capture these arrangements and share them across AFMC.

In determining the number of experts required for the study, some guidance was found suggesting from five to nine experts (Meyer and Booker, 1991: 87). Depending on the purpose of the study, the complexity and the expertise required, the panel might be large or small and local, state, national or international. Group size theory varies, but some

general rules-of-thumb indicate five to ten people for a homogenous population—that is, experts coming from the same discipline and fifteen to thirty people for a heterogeneous population, people with expertise on a particular topic but coming from different social/professional stratifications such as teachers, university academics and school principals (Delbeco et al., 1975; Uhl 1983; Moore 1987).

The initial Delphi study conducted by Dalkey and Helmer in the 1950s utilized seven experts. In past thesis efforts six participants were selected however, attrition rates were slightly higher than anticipated and therefore warranted selecting a higher number of participants for this study (Tougaw 2001). In the sponsorship letter from AFMC/PK, five to nine participants were requested from each Center. ASC provided seven participants, AAC provided five, and ESC provided six that met the minimum criteria stated earlier. To minimize the attrition rate, support was requested from each Center's Director of Contracting to encourage individual participation.

Question Formulation. No specific format or guidelines exist for questions formulation in a Delphi study. The technique used to formulate questions is left up to the researcher. In this case, it was necessary to avoid questions that could be answered with a yes or no, or with short, non-descriptive phrases. The object of each question was to generate meaningful discussions on the topic being addressed in order to gather as much information as possible. Since contracting methods in an Evolutionary Acquisition had never been researched before it was difficult to ascertain what questions would generate data that would be of value to this study.

A panel approach was taken to formulate the questions sets. I first originated a list of questions related to the research. This question set then was sent out to a panel of three

members, each with different areas of expertise. The question set was revised based upon the comments received from the panel. The question set was then released to the participants.

Cycles of Discussion. Participants were solicited beforehand via a thesis support request letter from AFMC/PK. This letter advised the participants of the purpose of the study, and provided information concerning the procedures and their anonymity. Two rounds of the Delphi technique were conducted as part of this study. Each round consisted of three iterations, one for each participating Center. Because each Center has unique missions, I believed that they might implement solutions tailored to their organizations. The responses for each Center were collected separately to prevent cross-center response contamination and to capture each Center's responses individually. The first round involved participants, at all Centers, submitting answers to an initial two question set in order to assess the level of individual involvement with EA program implementation and additionally to assess the contracting practices currently being employed.

The second round consisted of unique question sets for each Center based upon their responses to questions from the first round. ASC responded to a five-question set while AAC and ESC responded to separate 6 question sets. The second round questions sets were developed to further investigate constructs identified in the first round responses of each Center.

Assessing Contracting Practices in the Evolutionary Acquisition Environment. Following the completion of each round, I gathered the entire expert input and attempted to determine a group consensus. The information was synopsized and sent back out to

each panel with the next round of questions. From this information, I then compiled the areas of agreement as well as disagreement in order to form a basic lessons learned and to provide a roadmap for contracting directorates throughout the Air Force implementing EA. The findings of the study follow in Chapter IV.

IV. Findings and Analysis

Overview

This chapter provides a detailed account of the results of the research accomplished under the design and methodology described in Chapter III. Prior to the Delphi rounds, I provided each participant with a study overview and ground rules for the discussion. This initial information is provided in Appendix B. This study included six iterations of discussion within two distinct Delphi rounds. The results of the discussion are presented below.

Delphi Round 1

Participants from all three Centers received the same two-question set for Round 1. The response rates for the Air Armament Center and Electronic Systems Center were both 100 percent. The response rate for the Aeronautical Systems Center was 87.5 percent (7 of 8 participants). The initial questionnaire is provided in full text in Appendix B; a synopsis of specific responses is provided in Appendix D.

The first question focused on the constraints present in an EA environment. Responses to this initial question provided a more comprehensive understanding of the Government acquisition environment and some of the laws, regulations, and practices that help shape that environment. The second question investigated the contract and business arrangements that these contracting professionals are using within this environment.

Constraints in Evolutionary Acquisition Implementation. What constraints (statutory, regulatory, business practice, financial etc.) exist in implementing EA and how can we (or have you) overcome them?

Evolutionary acquisition is a relatively new concept that may conflict with existing regulations, guidance, and processes. I asked this question to identify these potential conflicts. In addition, the responses to this question provide insight on how each Center has accommodated EA within these identified constraints. The participants identified five main constraints to effective EA implementation. These constraints included the funding process, small business set-aside requirements, competition requirements, internal review processes and Government acquisition practices and procedures. The constraints are both real and perceived barriers that acquisition professionals must overcome in order to implement successful EA strategies.

Simmerman (1998) suggests that constraints can be interpreted as four different types of barriers: mindset, paper walls, partitions, and brick walls. A mindset constraint is formed by untested beliefs and perceptions and really doesn't exist. The paper wall constraint often looks impenetrable until tested; a common example is "getting management approval." Partition constraints are those that can be managed through time, effort, additional resources, and team or management support. Brick wall constraints are those that cannot be overcome and are considered unalterable. I grouped the responses for this question according to these different barrier types in order to help make sense of the problems experienced by the participants.

Mindset Constraints. The perception of the acquisition team, the end-users and the contractor create certain constraints that may be overcome with a change in perspective.

In certain instances, both the acquisition team and the end-user have a difficult time accepting a contract that delivers a product that only meets eighty percent of their requirements. They cannot visualize how this eighty percent solution will evolve into the total end requirement. A perception change is the only thing necessary to overcome this constraint.

Lack of specific guidance may also be included as a mindset constraint. Existing Government regulations do not adequately cover EA specifics. Reviewers and other acquisition team members find it hard to perform their respective jobs without the proper regulatory guidance. Reviewers tend to look at new business arrangements with the old regulations and methodologies even though these regulations do not prohibit them from employing new tools to accommodate EA.

Paper Wall Constraints. As stated previously, paper walls are constraints that seem impenetrable until they are tested. Submitted examples of paper walls are the need to shift from being process-oriented to results oriented, the need to tailor contract data requirements to what is actually required, and the desire to transfer Government furnished property on long-term, sole-source contracts to the contractor instead of the Government maintaining it. While all of these were submitted as barriers, action may dictate that all can easily be accomplished.

Partition Constraints. With upper management assistance, partition constraints may be overcome with a little effort, time and ingenuity. Participants submitted several constraints that fall into this category. These include Competition in Contracting Act requirements, Small Business set-aside requirements, the contract review and approval process, Government involvement in performance and testing, and the restrictions

imposed by the Defense Federal Acquisition Regulation Supplement and Air Force Federal Acquisition Regulation Supplement. Each of these constraints require some level of added paperwork, reporting, or review that lengthen the acquisition cycle time. While these constraints are real, time, effort, and additional help from teams and top management can overcome them.

Brick Wall Constraints. The Government funding process was overwhelmingly identified as one of the main constraints in implementing an evolutionary acquisition strategy. The main roadblocks mentioned were the availability and timing of funds, the color of money, and the affordability of the increments. Often, the approved funding level actually dictates the requirements. Problems occur when the contractor's spend plan exceeds the approved funding level for the particular program. Sufficient and appropriate levels of funding are essential to the success of an evolutionary acquisition. While suggestions were made on how to improve this process, it should be considered a brick wall constraint since only Congressional intervention will make any lasting change.

The constraints identified provide the preliminary framework of the operating environment of the acquisition professional. Some of these constraints, such as the mindset and paper wall constraints can be overcome simply through a change in perception or a testing of the system. In contrast, brick wall constraints, such as the funding process, are not easily, if at all, overcome. Partition constraints can be overcome with extra effort, time, teamwork, and top management support. The following section investigates the innovative practices being employed to overcome some of these partition constraints.

Contracting and Business Arrangements. What contracting/business arrangements do you think worked (or will work) in supporting an evolutionary acquisition (EA) strategy? Provide an example if possible.

I asked this question to determine what business strategies were being implemented by each Center in response to the EA edict. Strategies may differ between Centers as well as between programs within a Center. Responses to this question will help identify the varying approaches being taken. These responses in turn provide the foundation for formulating questions for future rounds.

No single business strategy emerged as the best way to implement the EA strategy. Several themes, however, were echoed across the Centers. Participants from all three Centers stressed the need to use business strategies that retain flexibility. Constructs revealed that help ensure flexibility include robust business planning, pre-contract agreements between the Government and the contractor, long-term relationships, and the need to encourage teaming behavior. Participants from all three Centers were also utilizing current contract types to accommodate an evolutionary acquisition. Multiple contract types are being combined under one contract vehicle. Award and incentive fees are being tailored to motivate specific contractor behavior such as technical performance and teaming. The best strategy for an evolutionary acquisition may be a strategy that is tailored to the specific requirement.

Robust business planning is a key to success in an EA environment. Advanced planning involves identifying the complete requirement, defining specific increments, agreeing on the acquisition approach, considering competition requirements, acknowledging the differences between the traditional acquisition process and the

evolutionary acquisition process from the start, and requiring early and continued involvement by current and potential suppliers.

As part of the initial planning, three participants responded that it was necessary to acknowledge the differences between the traditional acquisition process and the evolutionary acquisition process from the start. Both the Government and contractor personnel must recognize that there will be requirement changes and the high degree of flexibility required to accommodate these changes. Early and continued involvement by current and potential suppliers is required for an EA program to be successful. Taking the evolutionary acquisition approach also requires warfighter buy-in. Convincing the warfighter to initially accept a 75% to 80% solution may be a significant challenge.

The participants also identified some processes that warrant consideration in the business-planning phase. Two distinct processes, Cost As an Independent Variable (CAIV) and Total System Performance Responsibility (TSPR) were specifically identified as being useful tools in accommodating an evolutionary acquisition. Both CAIV and TSPR provide the Government and the contractor flexibility in reaching program goals. A further explanation of each follows.

Cost As an Independent Variable is a requirements trade-off process that focuses on cost-performance-schedule trade-offs in setting program goals. CAIV formalizes the process for cost-performance-schedule trade-offs, and engages the warfighter, the developer, and the supporter to facilitate meaningful trade-offs to arrive at an affordable balance among performance and cost. These trade-offs will enable the warfighter to make choices that will provide the best performance and schedule from the system within available resources.

Even though the Secretary of the Air Force, Dr. James Roche, announced at the May 2002 Aerospace and Defense Investors Conference that TSPR was dead, programs are evidently still utilizing the TSPR approach. Under a total system performance responsibility approach, the contractor assumes responsibility for systems engineering and life cycle management, functions usually performed by the Government. The benefits of this arrangement include decreased product delivery time; reduced costs and data, reduced program office manpower, fewer engineering change proposals, reduced total ownership cost, and increased product quality and readiness. The Secretary believes that TSPR abdicates to the contractor the Government's inherent systems engineering oversight responsibility. He does, however, support the contractor having Total System Support Responsibility (TSSR) for life-cycle sustainment support of some programs.

Robust business planning in an evolutionary acquisition environment may not require any new tools other than what is currently available. Participants from all three Centers concluded that current acquisition processes could be used to acquire weapon systems incrementally. These processes included use of engineering change proposals, pre-planned product improvement concepts, independent research and development, special rules for acquiring test and experimental systems, and commercial procedures found in Part 12 of the Federal Acquisition Regulation. The key is deciding up front how these tools will be utilized to acquire systems incrementally.

Pre-contract agreements compliment solid business planning. These agreements can reduce the amount of time it takes to actually place an item on contract. Prior to receipt of proposal and official negotiations, pre-agreement on acquisition planning and contract posturing can be accomplished. This arrangement is essentially a "hand-shake" agreement

prior to receipt of proposal that describes the task to be accomplished and the number of hours required to accomplish that task. Then the Government and contractor counterparts review, discuss, and reach an agreement on the number of hours required. Next the contractor applies rates to these hours and submits their proposal. There should be “no surprises” in the proposal and negotiations can be very swift to reach an agreement on rates, factors, profit or fee and any areas where counterparts could not reach an agreement. Other examples are long-term pricing agreements and forward pricing rate agreements, agreements between the Government and the contractor on pricing for specific elements that make up an acquisition. These elements may include labor rates for specific skill levels, overhead rates for a specified period of time, and other elements that can be defined and agreed upon with a great deal of certainty. As a result, proposals primarily involve negotiation of labor mix and hours. Using a one-pass process, differences are usually settled and efforts placed on contract quickly once the requirements are known and funding is provided.

In the private sector, companies are pursuing long-term relationships and agreements with suppliers to secure needed supplies and services for the long-term, with improved quality, and reduced costs. These relationships in the private sector are pursued on both the national and international levels. While current acquisition law, regulation, and guidance prohibit certain long-term arrangements, it does permit the contracting professional to be innovative within these constraints.

Two participants submitted an example of working within the constraints of the law. The Competition in Contracting Act (CICA) requires that all acquisitions be subject to full and open competition unless specifically waived. Within this constraint, these two

participants described how they conducted an up-front competition with the intent to establish a long-term relationship. The intent and expectations for the long-term relationships were explicitly stated at the beginning of the competition. Only firms willing to meet these expectations were permitted to compete. The result of this approach is the formulation of a long-term relationship that meets the competition constraints.

Successful relationships require a commitment not only on the part of the contractor but on the part of the Government as well. Participants provided a laundry list of successful long-term relationship initiatives that were currently being used in their programs. These initiatives include a results oriented payment procedure, a price-based acquisition philosophy, an alternative dispute resolution process, a waiver from obtaining cost and pricing data, specific program pricing models, and other price agreements for specific items such as spares, technical support, and warranties. The majority of these efforts are Government initiated and demonstrate the Government's commitment to the long-term relationship. Additional efforts such as commitment of funds for specific production levels and allowing the contractor to capitalize on their strengths may further facilitate these relationships.

Teaming arrangements can prove beneficial in an EA environment. Teaming is a business approach that brings together a group of people to achieve a common purpose. Teaming should not only occur with the contractor but also between programs and services as appropriate.

Employing the teaming concept within the Government can lead to development of common items for various services and programs through single process initiatives that spread the development costs among these elements and thereby lower overall costs of

each program. Successful teaming can also be accomplished in Joint Program Offices, where the needs of several services are combined, as is the case with the Joint Strike Fighter. Under this arrangement the cost of programs can be spread among the services thereby reducing costs to each service while minimizing overhead.

The Government and the contractor can realize many benefits when teamed together. Teaming with the contractor can produce time and cost savings. This arrangement requires a significant level of trust between the parties, leaving behind the “us versus them” mentality of the past. One promising teaming measure is electronic data sharing. Electronic data sharing employs computer technology for granting access to the contractor and the Government to financial, schedule, work-in-progress and planning data for a program. This approach facilitates immediate access to pertinent data such as cost and pricing models as well as costs incurred on a real-time basis. Electronic data sharing streamlines the negotiation process by providing both parties the data required to reach a fair and reasonable settlement. Teaming and long-term relationships are investigated further in Round 2(a).

No single contract type can cover the broad requirements of an evolutionary acquisition. Due to the ever-changing threat and technology environments, contracts require a high degree of flexibility to adapt to this environment. Different levels of associated risk and uncertainty may dictate utilizing different contract types line items within a contract. Some of the participants identified overarching and omnibus contracts as potential solutions for accommodating EA. Omnibus contracts are multiple award, indefinite delivery/indefinite quantity contracts with a broad scope and are awarded for multiple years with large ceilings. Overarching contracts are similar broadly scoped

contracts that employ multiple contract types, each associated with a different contract line item. These broad arrangements incorporate time and materials, cost plus award fee, cost plus fixed fee, firm fixed price, and fixed price award fee types underneath one umbrella contract. Both contract arrangements are hybrid indefinite delivery/indefinite quantity contracts that provide flexibility in quantity and schedule.

Depending on the requirement, it may also prove beneficial to have individual contracts with a limited scope. One contract type that provides significant flexibility for interim work is a Fixed Price Labor Hour contract. A Fixed Price Labor Hour contract can accommodate post development spirals where cost contracts are impossible or impractical. This arrangement provides for reimbursement of the fixed price rate for each labor hour expended in specific labor categories. Another contract arrangement that shows promise is a primarily Cost-Plus-Award Fee contract that allows for issuance of technical task directives. The technical task directive defines specific technical tasks, such as automation requirements for specific software applications, to be performed by the contractor. Through a contract modification, the contractor is directed to perform a specific numbered task that is already incorporated into the contract as part of an attachment. These directives provide flexibility and quick contract modification when requirements change or subsequent increments of capability need to be placed on contract in a short period of time.

Incentive arrangements are appropriate when key elements of performance are susceptible to qualitative measurement and subject to possible change over time. Incentives permit the Government to reward contractors for exceptional performance and

incentivize contractors to improve poor performance. It is up to the acquisition team to determine the best incentives, if any, for a given acquisition.

In an evolutionary acquisition, long-term teaming may be an important element to incentivize. At the Electronic Systems Center, the acquisition team has chosen to do just that through a Cost-Plus-Award Fee contract with a base fee and teaming fee broken out by fiscal year and obligated at the beginning of each fiscal year. This teaming fee is subject to semi-annual reviews that provide feedback to the contractors relative to teaming effectiveness. These reviews are accomplished prior to the release of the teaming dollars for the fiscal year. The contractor in this situation is incentivized to take certain actions that facilitate joint planning, cooperation, and communication. Failure to take such action results in loss of the teaming fee. The Teaming Fee application and specifics are investigated further in Round 2(c).

Cross-Center Comparison. Significant similarities exist between the Centers concerning constraints. Members from all three Centers agreed that competition requirements presented some roadblocks that were either time consuming or arduous to overcome. Also, all Centers, in one form or the other, submitted that the existing regulations and processes failed to adequately accommodate the move toward EA. These regulations and processes included the Defense and Air Force Federal Acquisition Regulation Supplements, small business requirements and the contract review process.

Participants from all three Centers mentioned flexibility as a key component in an EA strategy. Robust business planning and advance agreements between the contractor and Government facilitate this flexibility. There is also general agreement that the contracting strategy must be tailored to the specific acquisition. The Air Armament Center and

Electronic Systems Center participants stressed the importance of teaming and partnering with the contractor. The Air Armament Center accommodates this partnering through long-term relationships while the Electronic Systems Center encourages teaming through use of contractual incentives. Participants from all three Centers are using current contract types to accommodate EA.

Delphi Round 2

Evaluation of Round 1 responses revealed that flexibility was a key factor to consider when establishing contracting or business arrangements in an EA environment. The validity of the “newness” of evolutionary acquisition processes was also questioned. Two questions, identical for each Center, were asked to further investigate these constructs. Additionally, each participant was asked a set of questions to further investigate concepts revealed in Round 1 for their respective Center. These discussions were conducted in Round 2a for AAC, Round 2b for ASC, and Round 2c for ESC.

Flexible Contract Arrangements. Flexibility was submitted as a requirement for successful implementation of EA. If unconstrained by any other requirements and starting with a clean sheet of paper, can you think of a totally new contract arrangement that will facilitate flexibility? What are the advantages/disadvantages of your arrangement?

The Round 1 responses from all Centers revealed that the current regulations and processes did not adequately accommodate the implementation of the EA edict. I asked this question to discover what creative ways, if any, that the contracting professional may consider in an EA environment. In addition, the responses may provide preliminary insight on which regulations and processes are stifling the contracting process. This

question was posed to all participants to gain a more complete understanding of the approaches being taken across the Centers.

No “new” contract type or arrangement was identified in the responses to this question. The general consensus was that current contract types could be used to meet the objectives of an EA program. No “silver bullet” contract arrangement exists that meets all the requirements of every EA program. Contracts must be tailored to the specific acquisition. It is important to focus on the overall requirements of the program and then decide on the contract arrangement that best fulfills those requirements.

Even though a new contract type may not be deemed necessary to accommodate EA, a new approach in using the current contract types may prove beneficial. Thorough planning must be accomplished concerning quantities, configuration, performance, schedule, and production lots. Pre-contract partnering agreements with industry based upon professional association recommendations may help solve problems up front before the acquisition actually starts. Pre-agreement on labor hours, skill mix, and other items that do not infringe upon statutory rules and appropriation law may also aid in reducing the acquisition lead times.

The acquisition team may be forced to “rethink” how they contract for items. This may involve teaming with the contractor and actually permitting the contractor to drive the technology and performance criteria. The contractor should be fully empowered to leverage their strengths instead of being dictated the appropriate course of action to take when it makes sense. Team and personal incentives can be incorporated to motivate contractor performance in key areas. An additional incentive based upon the end users performance assessment may also warrant consideration.

Another aspect that must be given more attention is total life cycle costs and program results. The acquisition team must consider the effects that all parts of the system, both known and unknown, have on life cycle cost and performance. The contract arrangement must be evaluated against how well it helps meet the needs of the warfighter.

Consideration should be given to incorporating full warranty provisions that cover the entire system for an extended period of time to reduce sustainment costs. Longer contract performance periods of 10 to 15 years may further facilitate the management of total system life cycle costs.

Two members submitted broader use of Other Transaction Authority. Other Transactions for prototype projects provides the flexibility to depart from procurement contracts imposed by statute or regulation and can help integrate the government and commercial industry. Other Transactions for prototypes are based on commercial practices and as such, are not required to comply with the Federal Acquisition Regulation or any of its supplements, or those laws and regulations that are limited to procurement contracts, e.g. Truth in Negotiations Act and Cost Accounting Standards. The major drawback is that this authority is strictly limited to prototype projects and not granted to even low rate initial production.

Individual Perspectives of Evolutionary Acquisition. We can trace EA back at least to 1993, and there have been comments that EA is just new packaging for an old idea. Do you agree? If so, how will you accommodate incremental development in your contracts? If not, what new ways will you use to contractually implement the EA emphasis?

During Round 1 it was suggested that EA was nothing more than a new package for all the old processes. The majority of the participants in Round 1 did not directly express

this viewpoint, however, responses indicated that this might be the case. I asked this question to determine whether this is a lone sentiment or a more broadly held view.

Six of the fifteen participants submitted that EA is nothing new other than accomplishing incremental development on purpose rather than by default. A well-worded acquisition plan that is prepared well in advance using the tools that we have will still get the job done. Incremental development could be accommodated through use of sound business planning and a high degree of common sense. Planning for phases or including new technology when it becomes available can be accomplished by adding scope.

Under one participant's contract, they are using a combination of currently available tools to introduce new configurations or new technology. These include using pre-planned product improvement to incorporate new technology into the Firm Fixed Price production contract; using pricing models; employing the Cost As an Independent Variable approach; transitioning cost based development contracts into fixed price production contracts; and using price based analysis to achieve a price without the use of cost and pricing data.

Three of the remaining nine participants offered that EA does have its roots in and some of the same characteristics of previous ideas like Preplanned Product Improvement and phased technical approaches, but that it is not the same thing. One of these participants added that if this were an old practice then we would not be having as much trouble with the user regarding the concept of delivering something less than the 100% solution to the field. An important distinction provided was the necessity to accommodate

upfront recognition and agreement and planning of future requirement changes that occur over the life of the system.

Those that disagreed with the statement submitted that EA was giving the Government the opportunity to lean forward and apply new ideas to the existing tools that are out there. EA will involve getting people to think outside the box when implementing those changes. Freezing of requirements at a point in time, a predictable stream of funds, and some assurance that funds will be available for future increments were all submitted as major improvements to the present acquisition processes.

Incremental development will be accommodated by first having incremental tasks that are clearly defined and severable that can be implemented either in serial or parallel tasks. These tasks can be defined in a technical requirements document that describes the system specific technical aspects and is incorporated as an attachment to the contract. Specific spiral or increment delivery dates may be included in the delivery schedule in the contract.

AAC Specific Questions for Round 2(a). During the discussions conducted during Round 1, it became apparent that long-term relationships and long-term pricing arrangements were being used extensively at the Air Armament Center. Long-term relationships and pricing agreements must be structured to comply with statutory and regulatory requirements. I asked the following four questions to discover the specifics of these relationships and agreements and to provide the reader a preliminary roadmap for establishing such arrangements.

Elements of a Long-Term Relationship. The panel generally agreed that long-term relationships are required for success in an EA environment. What are the top three things that you would include as part of this relationship and how would you implement these relationships contractually?

Teamwork and trust are essential in the long-term relationship. The ultimate goal is to establish a seamless integrated product team of both Government and Contractor personnel where the lines between the two are blurred. Teamwork and trust may be accomplished through the sharing of a long-term vision between the Government and the contractor and agreement on the goals and strategies to make this vision a reality. Stable funding will further enhance trust in the relationship. Teamwork and trust can only be accomplished through a top down approach, with all the members of the team committed to developing the relationship.

Flexibility was again suggested as important. The long-term agreement must be flexible in both format and structure to meet the needs of all parties. Flexibility could be enhanced through the establishment of performance based technical documents that describe the acquisition philosophy and the entire system requirements and also through some sort of advance or long-term pricing agreement.

Successful long-term relationship must also include incentives to industry. These incentives are intended to be both positive and negative. The positive incentives reward a contractor for cost saving and quality improvement through increased profitability and reduced Government oversight. Negative incentives are tied to performance measures under the contractor's control and place the responsibility for meeting the performance measures strictly on the contractor. A major incentive currently being used, but not

favored by Secretary Roche, is Total System Performance Responsibility, which permits more contractor control, configuration management responsibility, self-governance, reduced government oversight, price based acquisition, and reduced data requirements. These incentives are best implemented through a special contract clause that specifically outlines the incentives and penalties associated with each performance measure.

Long-Term Relationship Decision Criteria. In addition to the top three things you would include in these long-term relationships, how would you decide whom to establish a long-term relationship with? How would ensure compliance with the Competition in Contracting Act? What are your selection criteria/thresholds? Who would approve the selection/arrangement?

Long-term relationships should not be established with every supplier. All five members agreed that the best way to decide whom to establish long-term agreements with was through initial competition. The initial competition would fulfill the requirements of the Competition in Contracting Act. Being up front with the long-term relationship intentions in the solicitation was necessary to form these relationships and ensure proper competition.

Past Performance was offered as a key selection criterion. Four of five participants submitted that the proposal that represented the best value for the Government in the particular relationship would carry the greatest weight. Information gathered through market research may also aid the selection process

Four of the five participants submitted that the approval authority for such an arrangement should be the Source Selection Authority. The Source Selection Authority is the individual responsible for determining who will ultimately receive a contract award.

The remaining participant suggested using current Federal Acquisition Regulation guidelines in determining who would be ultimately responsible. The decision authority under these guidelines is based upon the dollar value of the acquisition.

Long-Term Pricing Arrangement Specifics. Three participants observed that Long-Term Pricing Agreements should be included in an EA strategy. What specific pricing elements (labor, material, etc.) would you include in these arrangements and why? Which ones would you not include and why? How would you negotiate such an arrangement? Who would be responsible for maintaining the arrangement?

It is nearly impossible to negotiate all pricing elements for future increments when the technology has yet to evolve. All five participants agreed that the long term pricing agreement should include all cost elements that are finite and known at the time of the agreement. These elements should include only those costs that are in the contractor's control. The pricing agreement should be flexible enough to include an agreement on the inflation and other indexes that may affect the submitted prices. If accomplished in this fashion, the agreement remains flexible enough to accommodate any changes since the element of change has already been defined and agreed to.

Four of the five participants agreed that the long term pricing agreements should be established through competition, however no specifics were given concerning how this competition would be accomplished. Success of these arrangements hinges on openness and honesty of both parties while using an open books approach. This approach permits both the Government and contractor access to all the relevant data necessary to get to a bottom line number that is acceptable to both sides.

The group proposed that the maintenance of a pricing agreement would be the responsibility of both the Government and the Contractor. Specifically, the Government financial manager and the equivalent contractor counterpart would take the lead in this area. Additional monitoring responsibility should fall to the procuring contracting officer since he contractually incorporates the agreement.

Class Justification and Approval Specifics. One participant suggested obtaining a class justification and approval for all production, sustainment, and development of a system for a period of years. Would this work for your program? Why or why not? What are the advantages and disadvantages of a class justification and approval? When would you pursue this course of action and who would initiate it? How would the 50/50 law for sustainment be addressed?

In certain instances, the contracting officer may find that only one responsible source is available to provide a specific system. Two main reasons for soliciting only one source are when it is likely that award to any other source would result in substantial duplication of cost to the Government that is not expected to be recovered through competition, or unacceptable delays in fulfilling the agency's requirements. In accordance with the Federal Acquisition Regulation, a clear justification, explaining why competition is not being sought, is required. A specific management level, determined by the dollar amount of the acquisition, must approve this justification. Whenever a justification is made and approved on a class basis, the contracting officer must ensure that each contract action taken pursuant to the authority of the class justification and approval is within the scope of the class justification and approval and shall document the contract file for each

contract action accordingly. The class justification and approval, if written correctly, is basically a blanket waiver for acquiring an entire system without competition.

Three of the five members suggested that this blanket waiver would work for most major programs if it were broadly written to accommodate all anticipated aspects of a program. A blanket waiver would be most effective when you have a large number of like requirements or related requirements that will be purchased from a single supplier. This blanket waiver would eliminate many of the delays associated with the Government review and approval process. Further, the waiver would secure the sole source authority for the program and simplify the approval and review process for the entire program.

The pursuance of a class justification and approval can be a lengthy and frustrating process. Individual members submitted three disadvantages to a class justification and approval. First, the combining of items under a class justification and approval may place the program into a higher approval threshold and thus require another layer of review. Second, this blanket waiver may limit competition and actually reduce the supply base. Third, this waiver, in some instances, may reduce Government oversight and visibility into cost and pricing data.

The Government team should initiate the class justification and approval process. Specifically, the initiation should be a collaborative effort between contracting, the integrated product team and the program manager during the acquisition planning stage when limited or no competition is anticipated. The contracting officer should be responsible for ensuring that all the requirements for the justification and approval are met.

The management of system sustainment may become an issue when a class justification and approval is pursued. Title 10 United States Code 2464 and 2466 (50/50 Rule) stipulates that no more than fifty percent of the funds managed by the Department of Defense for depot (major overhaul) maintenance can be used for contractor depot maintenance. One participant proposed that we are stuck with the 50/50 rule and would just have to live with it. Early industry involvement may provide alternative solutions for this sustainment issue.

One such alternative solution for addressing the requirements of the 50/50 Rule is an all-inclusive warranty provided by the contractor. Two of the four participants suggested including warranty of the product in the contract price. Sustainment is thereby minimized and no 50/50 issues should arise. This warranty solution hinged upon the contractor producing a quality product that meets the system specification and subsequent fulfillment of the warranty obligations.

Another participant submitted that the current 50/50 rule is under discussion in Congress but that his program operated under the Source of Repair Assignment Process decision. This process assigned the specific components that would be repaired by the Government and those that would be repaired by the contractor. The participant submitted that without this decision, a waiver or exemption would have to be pursued or a joint agreement would have to be reached defining those items that would be best incorporated under contractor repair.

ASC Specific Questions for Round 2(b). Evaluation of the Round 1 discussion with the participants at ASC revealed a couple key areas that required further investigation: the impact of the Air Force Federal Acquisition Regulation Supplement rewrite and the

application of both single and multiple award indefinite delivery/indefinite quantity contracts. Three questions related to these areas and their subsequent responses follow.

Impact of the AFFARS Rewrite. What potential impacts will the Air Force Federal Acquisition Regulation Supplement (June 2002) rewrite have on your program? (Air Force Federal Acquisition Regulation site link: <http://farsite.hill.af.mil/vffar1.htm>).

In Round 1, the participants from ASC identified the requirements of the Air Force Federal Acquisition Regulation Supplement (AFFARS) as a constraint in implementing an EA strategy. Subsequently, after the Round 1 responses were received, a significant rewrite of the AFFARS was released. I asked this question to discover the impacts of the rewrite and how the rewrite might have affected individual programs.

One of the significant impacts of the Air Force Federal Acquisition Regulation Supplement rewrite is the delegation of the Program Executive Officer /Designated Acquisition Commander as the Head of Contracting Activity for Program Executive Officer /Designated Acquisition Commander designated programs. The Program Executive Officer is a flag rank military or civilian equivalent official who has primary responsibility for directing several major acquisition programs and for assigned major system and non-major system acquisition programs. The Air Force Federal Acquisition Regulation Supplement rewrite resulted in less oversight on Program Executive Officer /Designated Acquisition Commander designated programs and delegates authority to the Program Executive Officer /Designated Acquisition Commander to establish the thresholds and procedures for contract review and clearance. One member submitted that they have already seen the delegation of authority for items such as Acquisition Strategy

Panel, Single Acquisition Management Plan, and undefinitized contracting actions while the justification and approval authority delegation remained unchanged.

A laundry list of literally hundreds of request for proposal and contract clauses has been removed. The Air Force Federal Acquisition Regulation Supplement no longer specifies processes. Each program is now allowed to establish its own processes and write unique clauses as needed.

On the downside, one member submitted that the rewrite only changes whom he is required to brief and may only save a couple of days in the process. This member also proposed that significant timesavings might only be achieved by focusing on the requirements side of the acquisition cycle. Two other participants stated that the Air Force Federal Acquisition Regulation Supplement rewrite would have no impact on their respective programs. This may be because of their involvement in classified programs.

Single Award Indefinite Delivery/Indefinite Quantity Contract Specifics. Under what conditions/circumstances would a single award indefinite delivery/indefinite quantity contract arrangement benefit an EA strategy? How would you structure/price for future increments under this arrangement?

Single award indefinite delivery/indefinite quantity contracts are currently being used for development through production. Many of these contracts are from 10 to 15 years in length. Efforts currently under this contract arrangement include Interim Contractor Support, Contractor Logistics Support, maintenance, and modifications. One member submitted that this contract arrangement would not be appropriate in a program where engineering, manufacturing, development, and production ran concurrently. This single source arrangement is best suited where only one contractor can reasonably perform the

work because of the uniqueness or highly specialized work or the tasks are so intricately related that seeking competition would be considered unreasonable.

The second part of the question addresses how future increments would be priced/structured in this arrangement. Flexibility was a common theme for four members. The key was tailoring the pricing arrangement and contract structure to the particular acquisition without locking in those items that were either unknown or not completely defined. This could be accomplished by negotiating labor rates and skill mix; basing future increments on the success of current increments; and structuring the contract to fit the type of effort for each delivery order. Even though indefinite delivery/indefinite quantity contracts typically should have a priced effort, the current movement is to reserve contract line items for future effort with either established ceiling prices or no price limit at all.

Multiple Award Indefinite Delivery/Indefinite Quantity Contract Specifics. Under what conditions/circumstances would a multiple award indefinite delivery/indefinite quantity contract arrangement benefit an EA strategy? How would you structure/price for future increments under this arrangement?

It was unclear under what circumstances a multiple award indefinite delivery/indefinite quantity contract arrangement would be the best choice. Two of the participants were only familiar with sole source or single award indefinite delivery/indefinite quantity contracts and could not think of a situation where this arrangement might be appropriate. With the tight defense budget, a participant proposed that it was highly unlikely that multiple sources could be afforded simultaneous funding.

Three of the participants did submit the multiple award arrangement would require well-planned increments that are clearly defined and priced if possible. Tasks or increments must be easily separated so that they can then be incorporated into a master plan that defines the specifics to be delivered or the tasks to be performed under each delivery order. A multiple award arrangement could expand the supplier base, increase competition, lead to shorter performance periods and create program flexibility.

ESC Specific Questions for Round 2(c). Evaluation of the Round 1 discussion with the participants at ESC revealed that further discussion was required in the areas of definition and incorporation of increments in the contractual document, the teaming award fee arrangement, and accommodating the requirements of the Competition in Contracting Act. A series of four questions directly related to these discussion areas and their subsequent responses follows.

The Increment Definition Process. The definition of increments or spirals was raised as a concern in the EA arrangement. What processes/approach do you take to define each increment? Who is involved in these processes? How do you define future increments for unknown capabilities? At what point are these future increments definitions refined further?

No single approach emerged as the best way to define increments. It was generally agreed that increment definition should be accomplished up front as much as possible. This definition process involves agreement on the time and method to follow along the way. The approach must clearly define the beginning and ending points for each increment and result in a well defined deliverable.

Using a contract line item structure to define the first increment and then incorporating options to accommodate future increments may accomplish increment definition.

Participants suggested that a Spiral Development Integrated Process Team could best define each increment. In a competitive acquisition however, this responsibility fell on the contractor through submittal of an increment plan during the bidding process.

The increment definition process may involve anyone in the acquisition team from the end user to the contractor. A team approach tailored to the specific acquisition may make the most sense. Under this approach, common sense dictates whether the program offices, end users, or the contractor are the major players in defining the program increments.

Unknown capabilities pose their own set of unique challenges in the refinement of future increments. These unique challenges require ongoing discussion between the program office, user and contractor, as well as amendment of the Acquisition Plan, contract, and funding as necessary to incorporate these increments. Increased reliance may be placed on the requirements definition, risk analysis, and market research processes. Tradeoffs may have to be made through the Cost As an Independent Variable process. This process involves utilizing a capabilities matrix to determine tradeoffs without affecting cost and setting key performance parameters based upon these tradeoffs.

Contractual Inclusion of Increments. How do/would you incorporate all increments in a contractual document? How would this appear in the contract document (contract line item, clause, attachment, etc.)?

In order to place anything on contract it is necessary to be able to describe the deliverable with a reasonable amount of clarity to ensure contract requirements are met.

Difficulties may arise in trying to accomplish this task for unknown future increments. The responses indicate that the documentation necessary to incorporate increments could be included in the contract line item structure, as an attachment or by utilizing a special contract clause. The incorporation method would be tailored to the specific requirement. For example, the evolutionary acquisition plan and the technical requirements document could both be incorporated as attachments to the contract; individual contract line items could be developed to reflect and clearly define deliverables; and specific delivery dates for the increments could be included in Section F of the contract.

Applicability of the Teaming Fee Arrangement. One participant presented the use of a unique award fee plan that included a Teaming Fee. Would this arrangement work for your acquisition? Why or why not? How would you define the evaluation criteria for such an arrangement? Who would determine, evaluate, and approve these criteria?

In Round 1, a unique teaming arrangement was presented that incentivized the contractor for how well they met the teaming expectations of the Government. Even though the teaming fee arrangement is currently working well it has a way to go before being deemed fully successful. Participants were not sure if this arrangement would work or even be necessary in their respective programs.

This teaming award fee arrangement has worked in the both sole source and long-term support and maintenance contracts for major systems. In the sole source situation, however, the contractor may have heavily influenced the evaluation criteria. This arrangement might also be considered for use in a fly-off or down select situation where various teams are competing for the development effort.

There was a group consensus that the acquisition team should define and evaluate the criteria and might, in certain instances, partner with the contractor to accomplish this task. Approval of these criteria should be the responsibility of the fee determining official who is also ultimately responsible for reviewing the recommendation of the award fee review board, considering all pertinent data, and determining the earned award fee amount for each evaluation period.

A wide variety of evaluation criteria responses were received. The evaluation criteria should include incentives for the contractor to work cooperatively with the Government as a team. This is a subjective process that involves defining areas of risk that might be mitigated by the inclusion of an appropriate incentive; formulating an esoteric arrangement contingent upon legally binding arrangements and partnerships between the contractor team and the Government acquisition strategy team; and defining the importance of events that drive the award fee.

Accommodating Competition in Contracting Act Requirements. Two participants observed that the Competition in Contracting Act was a constraint in an EA arrangement. Do you agree or disagree with this statement? Why? How do/would you overcome the Competition in Contracting Act requirements? Have you been successful in doing so?

The requirements of the Competition in Contracting Act (CICA) can be a constraint in an EA environment, yet can be overcome through up-front planning. Acquisition teams must start planning early and obtain buy-in from relevant stakeholders. Clearly documenting the EA approach in the acquisition strategy panel, single acquisition management plan, and contractual document may eliminate questions that arise about re-competing after each spiral or increment. Spirals (increments) must be clearly defined up

front and competed as appropriate. In sole source situations this involves using the justification and approval process.

Summary

This chapter described the qualitative data created through the Delphi discussion conducted throughout this study. Each question asked of the expert panels was presented along with a description of the responses provided by the participants. This chapter also discussed my preliminary conclusions as the discussion process progressed. The next chapter will discuss the overall conclusions drawn from the research.

V. Conclusions and Recommendations

Overview

This chapter concludes the research report by addressing and answering the research questions presented in Chapter I, making recommendations based upon those answers, and finally, discussing the limitations of this study and suggesting future research.

Conclusions

Research Question 1. What are the actual and perceived regulatory and procedural roadblocks that are a result of the implementation of an EA strategy?

There was a general consensus across the panel members that funding, competition, and small business laws and regulations as well as other outdated regulations and processes pose significant challenges to the acquisition team implementing EA strategies.

The acquisition funding process places significant roadblocks in the way of the acquisition team attempting to implement an EA strategy. Acquisition team members are forced to deal with several different appropriations, and subdivisions of those appropriations, within one contract. The program office cannot easily manage funds since they ultimately have little control over the amount and timeliness of these funds.

Approved funding levels often fail to match the levels needed to sustain economical production numbers. Congressional oversight places additional reporting burdens on the acquisition team. These roadblocks are not easily overcome and often dictate the requirement instead of the requirement dictating the funding level.

Statutory requirements such as the Competition in Contracting Act and Small Business Act also place additional reporting and coordination requirements on the acquisition team. Proactive business planning can prevent these statutory requirements from becoming a burden to the acquisition professional. This requires the entire acquisition team to fully address competition, small business, and other requirements early in the acquisition planning process in order to reduce the impact on acquisition lead times.

The main roadblock identified from this research study is not one single event, but rather a combination of Government processes that fail to add significant value to the overall acquisition process. Regulations are often outdated and fail to adequately address the latest acquisition practices. In turn, team members from the buyer to the reviewer are forced to contend with meeting the requirements imposed by these outdated regulations. In order to effectively implement EA, the Government must ensure that its practices and processes, to include regulatory guidance, reflect the intent of the preference for EA strategies. All acquisition processes should be tailored to accommodate this preference instead of the EA strategies being tailored to our current processes.

Research Question 2. What innovative solutions are being implemented that minimize the effects of these challenges?

A general consensus across the panel members was that proactive and innovative business planning by the program team coupled with a long-term partnership with industry helps to successfully implement EA strategies.

Contracting professionals are placing increased emphasis on proactive business planning. Being proactive requires the team to look beyond the next event. Proactivity requires the team to view how all required actions affect the acquisition and how to minimize the effects of these actions. Participants from all Centers reported how they are currently tailoring their processes to accommodate EA strategies. In addition, the acquisition teams are also implementing new processes that seem to be a good fit in the EA environment.

Long-term relationships and pricing agreements are being established to accelerate the acquisition process and aid in planning. Negotiations are shortened through use of pre-agreements on skill mix, labor hours, and rates and factors. Competition waivers are being pursued for entire systems when it makes sense to do so. Adversarial relationships between the Government and contractor teams are being transformed into teaming relationships to further accelerate the acquisition process. Individually, each of the aforementioned actions, only provide limited relief; combined they may provide the solution to many of our problems.

Research Question 3. What contracting/business arrangements best support implementation of evolutionary acquisition?

There was a general consensus across the panel members that no single contracting type, action, or business arrangement emerged as the solution to implementing EA nor are any radical new arrangements required. A combination of common sense, ingenuity, and use of current contract arrangements and tools seem to be the necessary resources to successfully implement an EA strategy. Each contract or business arrangement must be

tailored to the specific acquisition. Any attempt to apply a specific arrangement across a broad range of programs and acquisition situations will likely prove to be counterproductive.

Focus should be placed on how to best utilize current contract types. One area that may produce significant results is incentives. Acquisition teams are in the very early stages of discovering how to best incentivize contractor performance in an EA environment. Increased attention must be placed on areas where the Government should reward performance above the contract requirements and where we should reward the contractor for being more proactive. Incentives should reflect value-added performance or features that accelerate capability to our warfighters.

Once these areas have been identified, incentives then should be tailored to best motivate the desired contractor performance. These incentives should be tied to areas of cost savings, product improvement, increase in delivery quantity, and decrease in delivery cycle time. Further areas for consideration are performance-based cash flows, prize contracts, and share-in-savings incentives (Development of Innovative Contract Incentives 2000).

We may need to go no further than the first aviation contract established with the Wright Brothers on February 10, 1908. Paragraph 4 of this contract laid out the incentive in a very understandable format as follows:

“The flying machine should be designed to have a speed of at least forty miles per hour in still air, but bidders must submit quotations in their proposals for cost depending upon the speed attained during the trial flight, according to the following scale:

40 miles per hour, 100 per cent.
39 miles per hour, 90 per cent
38 miles per hour, 80 per cent.
37 miles per hour, 70 per cent.
36 miles per hour, 60 per cent.
Less than 36 miles per hour rejected.
41 miles per hour, 110 per cent.
42 miles per hour, 120 per cent.
42 miles per hour, 130 per cent.
43 miles per hour, 140 per cent.
44 miles per hour, 150 per cent.”

(Edwards 2002).

It may be beneficial for the acquisition community to learn from our acquisition past in order to accommodate our current and future initiatives.

Recommendations

Common sense must dictate the actions taken during any acquisition. Long-term relationships should be pursued with suppliers when it makes sense to do and is permitted under the law. Contractors should be incentivized only for performance and actions that are worth paying extra for. Performance incentives could motivate the contractor to accelerate technology if structured correctly. The Government on the other hand, must be willing to pay the contractor for the extra effort and not hinder the contractor from achieving these higher performance goals.

Careful consideration must be given in developing any acquisition plan. A systems engineering approach that considers all aspects of the acquisition from the beginning to the end must be employed up front to reduce the impact on total life cycle costs and

acquisition lead times. Early contractor involvement will aid in the planning phase.

Contractors should be included in all aspects of planning that are not directly related to source selection decisions.

The acquisition professional will require a new set of skills. Team members must train themselves to look outside their areas of expertise and take on a full systems view of the acquisition. Decisions must be weighed against the impact they have on the entire program rather than on the individual action. Contracting professionals must not only be proficient and innovative at formulating contracts, but also at being effective business advisors for the acquisition team.

Finally, as stated previously, we cannot forget the lessons learned from our past. The Government has been reforming the acquisition process since the day the first Army Quartermaster placed his order for muskets and gunpowder. The Government must take a closer look at acquisition practices of the past. Not all was bad, in fact, some of the old practices, if reintroduced today, may seem like the latest innovations. There is a lot to learn from what we have already accomplished. The push for new must have the solid foundation built in the past.

Limitations

This study only examined a relatively small cross section of Air Force acquisition programs, consisting of a total of 18 participants from the Air Force Materiel Command Product Centers and was conducted under strict time constraints. This research was based on the relevant literature pertaining to the subject and conducted in accordance with the principles of the selected method; the study does suffer from some limitations.

The method, used to create the data for analysis in this study, required participants to remain anonymous throughout the study. This method also limited the size of the discussion groups in order to facilitate meaningful discussion. It appears however, that determining sample size is not a cut-and-dried procedure. Despite a large amount of literature on the topic, sample size determination involves seemingly in all cases an element of informed judgment (Hill 1998). In this case, the sample size was determined to be sufficient based upon the amount of agreement reached across all participants. The results of this study have a limited external validity and any conclusions can only be drawn within the panel of experts surveyed. The results of this study cannot be stated to represent the opinion of all experts in the contracting career field.

Finally, it became apparent at different points during the discussions that the experience level and familiarity with EA strategies affected the responses provided. Evolutionary acquisition has not been widely implemented across the Air Force. The respondents' limited exposure to the processes necessary to effectively implement EA may have directly affected their ability to share a specific lesson learned.

Recommendations for Future Research

The questions submitted to the experts in this study often generated more information than could possibly be examined in one research study. This study identified processes that individual programs are currently using to accommodate EA. These processes were not investigated in-depth and require follow-up to determine the specific elements of each of these processes that may be applicable across a broad range of programs. The

limitations of this study and the responses generated from this study, led to the following recommendations for future research:

The evolutionary acquisition approach requires the contracting professional to find innovative ways to acquire systems in an incremental fashion in less time. Finding these innovative solutions cannot be accomplished in a vacuum. It is recommended that future research be conducted to determine what would motivate contractor performance and to gain a further understanding of the demands that Government procurement regulations place on the contractor. This research may best be accomplished through gathering input directly from the contractors or trade associations and utilizing that input to tailor Government processes where possible.

This study focused on the opinions of a few, albeit highly qualified, individuals concerning the implementation of EA strategies. This study focused on the Air Force Materiel Command Centers. All Department of Defense agencies are attempting to streamline their acquisition processes, some more successfully than others. It would be beneficial for future research to explore how the other services utilize innovative techniques and processes, if any, to contractually implement evolutionary acquisition strategies. Future research may determine that each Service may have best practices that could be more broadly applied across the Department of Defense.

A final recommendation for future research born out of this study concerns the difficulties created by outdated regulation and guidance. Once the Department of Defense 5000 (DoD 5000) Series and the Chairman of the Joint Chiefs of Staff Instructions (CJCSIs) regarding acquisition procedures have been revised and published to reflect the evolutionary acquisition strategies, it is recommended that future study be conducted to

determine which internal processes will require revision to comply with this guidance and to identify areas requiring further revision to accommodate EA strategies.

Summary

This chapter discussed the conclusions drawn from the research described in the four previous chapters, provided recommendations based on those conclusions, and offered suggestions for future research on the subject.

Evolutionary acquisition techniques provide the framework for acquiring systems in an incremental fashion while delivering warfighting capability to the end user in a shorter period of time. These techniques are new to the acquisition team and require the employment of robust business planning and flexible and innovative business arrangements to make these techniques work. Challenges are being experienced in implementing evolutionary acquisition, however, acquisition professionals are finding innovative ways to use existing tools to overcome these challenges. Future studies are required to ensure that these innovative practices are captured and shared across the Department of Defense and that our regulations and business practices support the implementation of evolutionary acquisition strategies.

Appendix A: Expert Panel Membership

Air Armament Center (AAC)

1. Ms. Jeff Duval, GS-13
AAC/YV; Procuring Contracting Officer
2. Mr. Ronald Foskey, GS-13
AAC/AE; Source Selection Officer
3. Ms. Bridget L. Tuominen, GS-13
AAC/YAK; Procuring Contracting Officer
4. Mr. Jeffrey Cox, GS-12
AAC/WMGK; Contracting Officer
5. MSgt. Tony D. Roy Jr.
AAC/WMOK; Contracting Officer

Electronic Systems Center (ESC)

1. Ms. Sharlene Begley, GS-13
ESC/JSK; Contracting Officer
2. Ms. Claire R. Litalien, GS-13
ESC/SRK; Procuring Contracting Officer
3. Mr. Paul Canham, GS-13
ESC/ACK; Procuring Contracting Officer
4. Mr. Joe Zimmerman, GS-13
ESC/JSK; Contracting Officer
5. Anonymous, GS-13
6. Ms. Lisa Clark, GS-14
BMC3 Capabilities Systems, Director of Contracting
7. Mr. Bill Donaldson, GS-13
ESC/MCK; Procuring Contracting Officer
8. Ms. Elise Locker, Contractor BAE Systems
ESC/AWPC; AWACS Block 40/45 Program

Aeronautical Systems Center (ASC)

1. Mr. Tony Armes, GS-13
ASC/YSKD; Procuring Contracting Officer
2. Mr. John Brannan, GS-14
ASC/PKC; Procurement Analyst
3. Mrs. Elizabeth Z. Gillespie, GS-13
ASC/RAKVG; Contracting Officer
4. Ms. Sue L. Tormey, GS-13
ASC/PKC; Contract Support Analyst
5. Mr. Kevin Vangsness, GS-14
ASC/FBX; Procuring Contracting Officer

Appendix B: E-mail of Initial Information and
Delphi Round 1 Questionnaire to Participants

To: <*Participant E-mail Address*>

Subject: Thesis Participation Study

<*Participant Name*>,

I'm Lt. Gary Wellman at the AFIT Graduate School. I am conducting my thesis on Contracting Issues Associated with the Implementation of Evolutionary Acquisition Practices. The information gathered during this study will not only be used to complete my thesis requirement but also in the development of a contracting specific EA course that I will be teaching after graduation in March 03. Your participation will help formulate the foundation of this lesson and provide a practical lessons learned to the entire Air Force contracting community. I am being graciously sponsored by Col. Parsons, AFMC/PK for this effort. Col. Parsons agrees that developing a roadmap for implementation of EA in a contracting environment is extremely important.

Thank you for volunteering to participate as a panel member for my thesis research. During the next couple of weeks, the group from <*Center Name*> will delve into the contracting issues associated with implementing Evolutionary Acquisition. During this time, I will act as a facilitator for the discussion as well as providing feedback and steering questions for the group. The group members will remain anonymous and this is considered a non-attributive environment. I will be as responsive as I can with feedback from the group in order to keep the group discussion progressing. I realize this imposes

additional time on your part and I thank you in advance for your timely responses to the posed questions.

The study will continue until a group consensus is met on the pertinent contracting issues associated with EA. If you have any questions along the way or need additional time to formulate your response, please e-mail me so I can make changes as needed. Please respond via e-mail to all questions. Again thank you for your participation, without you this effort would be impossible.

Sincerely.

Lt. Gary Wellman

AFIT/ENV

5-7777 ext 3278

gary.wellman@afit.edu

Without further delay, here are the first questions:

What constraints (statutory, regulatory, business practice, financial etc...) exist in implementing EA and how can we (or have you) overcome them?

What contracting/business arrangements do you think worked (or will work) in supporting an evolutionary acquisition (EA) strategy? Provide an example if possible.

Appendix C: Contract and Agreement Types

Fixed –Price Contract Types

Firm-Fixed-Price. A firm-fixed-price contract is suitable for acquiring commercial items (see Parts 2 and 12) or for acquiring other supplies or services on the basis of reasonably definite functional or detailed specifications (see Part 11) when the contracting officer can establish fair and reasonable prices at the outset (FAR 16.202-2).

Fixed-Price With Economic Price Adjustment. A fixed-price contract with economic price adjustment may be used when there is serious doubt concerning the stability of market or labor conditions that will exist during an extended period of contract performance, and contingencies that would otherwise be included in the contract price can be identified and covered separately in the contract (FAR 16.203-2).

Fixed-Price With Prospective Price Redetermination. A fixed-price contract with prospective price redetermination may be used in acquisitions of quantity production or services for which it is possible to negotiate a fair and reasonable firm fixed price for an initial period, but not for subsequent periods of contract performance (FAR 16.205-2).

Fixed-Ceiling Price With Retroactive Price Redetermination. A fixed-ceiling-price contract with retroactive price redetermination is appropriate for research and development contracts estimated at \$100,000 or less when it is established at the outset that a fair and reasonable firm fixed price cannot be negotiated and that the amount involved and short performance period make the use of any other fixed-price contract type impracticable (FAR 16.206-2).

Firm-Fixed-Price, Level of Effort. A firm-fixed-price, level-of-effort term contract is suitable for investigation or study in a specific research and development area. The product of the contract is usually a report showing the results achieved through application of the required level of effort. However, payment is based on the effort expended rather than on the results achieved (FAR 16.207-2).

Fixed-Price Incentive. A fixed-price incentive contract is appropriate when a firm-fixed-price contract is not suitable; the nature of the supplies or services being acquired and other circumstances of the acquisition are such that the contractor's assumption of a degree of cost responsibility will provide a positive profit incentive for effective cost control and performance; and if the contract also includes incentives on technical performance and/or delivery, the performance requirements provide a reasonable opportunity for the incentives to have a meaningful impact on the contractor's management of the work (FAR 16.403).

Fixed-Price Incentive (Firm Target). A fixed-price incentive (firm target) contract is appropriate when the parties can negotiate at the outset a firm target cost, target profit, and profit adjustment formula that will provide a fair and reasonable incentive and a ceiling that provides for the contractor to assume an appropriate share of the risk. When the contractor assumes a considerable or major share of the cost responsibility under the adjustment formula, the target profit should reflect this responsibility (FAR 16.403-1).

Fixed-Price Incentive (Successive Targets). A fixed-price incentive (successive targets) contract is appropriate when available cost or pricing information is not sufficient to permit the negotiation of a realistic firm target cost and profit before award; sufficient information is available to permit negotiation of initial targets; and there is reasonable

assurance that additional reliable information will be available at an early point in the contract performance so as to permit negotiation of either a firm fixed price or firm targets and a formula for establishing final profit and price that will provide a fair and reasonable incentive. This additional information is not limited to experience under the contract, itself, but may be drawn from other contracts for the same or similar items (FAR 16.403-2).

Fixed-Price With Award Fee. Fixed price with award fee provisions may be used in fixed-price contracts when the Government wishes to motivate a contractor and other incentives cannot be used because contractor performance cannot be measured objectively (FAR 16.404).

Cost Contract Types

Cost. A cost contract is a cost-reimbursement contract in which the contractor receives no fee. A cost contract may be appropriate for research and development work, particularly with nonprofit educational institutions or other nonprofit organizations, and for facilities contracts (FAR 16.302).

Cost Sharing. A cost-sharing contract is a cost-reimbursement contract in which the contractor receives no fee and is reimbursed only for an agreed-upon portion of its allowable costs. A cost-sharing contract may be used when the contractor agrees to absorb a portion of the costs, in the expectation of substantial compensating benefits (FAR 16.303).

Cost Plus Incentive. A cost-plus-incentive-fee contract is a cost-reimbursement contract that provides for an initially negotiated fee to be adjusted later by a formula

based on the relationship of total allowable costs to total target costs. A cost-plus-incentive-fee contract is appropriate for services or development and test programs when a cost-reimbursement contract is necessary and a target cost and a fee adjustment formula can be negotiated that are likely to motivate the contractor to manage effectively (FAR 16.304).

Cost Plus Fixed Fee. A cost-plus-fixed-fee contract is a cost-reimbursement contract that provides for payment to the contractor of a negotiated fee that is fixed at the inception of the contract. A cost-plus-fixed-fee contract is suitable for use when the contract is for the performance of research or preliminary exploration or study, and the level of effort required is unknown; or the contract is for development and test, and using a cost-plus-incentive-fee contract is not practical.

A cost-plus-fixed-fee contract normally should not be used in development of major systems once preliminary exploration, studies, and risk reduction have indicated a high degree of probability that the development is achievable and the Government has established reasonably firm performance objectives and schedules. (FAR 16.405-1)

Cost Plus Award Fee. A cost-plus-award-fee contract is a cost-reimbursement contract that provides for a fee consisting of a base amount (which may be zero) fixed at inception of the contract and an award amount, based upon a judgmental evaluation by the Government, sufficient to provide motivation for excellence in contract performance. The cost-plus-award-fee contract is suitable for use when the work to be performed is such that it is neither feasible nor effective to devise predetermined objective incentive targets applicable to cost, technical performance, or schedule; the likelihood of meeting acquisition objectives will be enhanced by using a contract that effectively motivates the

contractor toward exceptional performance and provides the Government with the flexibility to evaluate both actual performance and the conditions under which it was achieved; and any additional administrative effort and cost required to monitor and evaluate performance are justified by the expected benefits (FAR 16.405-2).

Indefinite Delivery Contract Types

Definite Quantity. A definite-quantity contract provides for delivery of a definite quantity of specific supplies or services for a fixed period, with deliveries or performance to be scheduled at designated locations upon order. A definite-quantity contract may be used when it can be determined in advance that a definite quantity of supplies or services will be required during the contract period and the supplies or services are regularly available or will be available after a short lead time (FAR 16.502).

Requirements. A requirements contract provides for filling all actual purchase requirements of designated Government activities for supplies or services during a specified contract period, with deliveries or performance to be scheduled by placing orders with the contractor. A requirements contract may be appropriate for acquiring any supplies or services when the Government anticipates recurring requirements but cannot predetermine the precise quantities of supplies or services that designated Government activities will need during a definite period (FAR 16.503).

Indefinite Quantity. An indefinite-quantity contract provides for an indefinite quantity, within stated limits, of supplies or services during a fixed period. Contracting officers may use an indefinite-quantity contract when the Government cannot predetermine, above a specified minimum, the precise quantities of supplies or services

that the Government will require during the contract period, and it is inadvisable for the Government to commit itself for more than a minimum quantity. The contracting officer should use an indefinite-quantity contract only when a recurring need is anticipated (FAR 16.504).

Other Contract Types

Time-and-Materials. A time-and-materials contract provides for acquiring supplies or services on the basis of direct labor hours at specified fixed hourly rates that include wages, overhead, general and administrative expenses, and profit; and materials at cost, including, if appropriate, material handling costs as part of material costs. A time-and-materials contract may be used only when it is not possible at the time of placing the contract to estimate accurately the extent or duration of the work or to anticipate costs with any reasonable degree of confidence (FAR 16.601).

Labor Hour. A labor-hour contract is a variation of the time-and-materials contract, differing only in that the contractor does not supply materials. A labor hour contract may be used only when it is not possible at the time of placing the contract to estimate accurately the extent or duration of the work or to anticipate costs with any reasonable degree of confidence (FAR 16.602).

Letter Contracts. A letter contract is a written preliminary contractual instrument that authorizes the contractor to begin immediately manufacturing supplies or performing services. A letter contract may be used when the Government's interests demand that the contractor be given a binding commitment so that work can start immediately and negotiating a definitive contract is not possible in sufficient time to meet the requirement. A letter contract should be as complete and definite as feasible under the circumstances.

Appendix D: Synopsis of Responses for Delphi Round 1

Table 1. AAC Responses to Round 1/ Question 1

What contracting/business arrangements do you think worked (or will work) in supporting an evolutionary acquisition (EA) strategy? Provide an example if possible. 6 of 6 panelists responding

Pushing technology-focused acquisitions through the contracting process faster is the key to meeting the warfighters needs. We simply take to much time through our checks and crosschecks to field products to the troops. By the time they are in the troops hands, they are cost prohibitive and out of date. Suggest buying the 75 to 80% solutions, performing an accelerated 1st article test and field the initial production units. Let the troops using the product actually critique and suggest improvements to the product. It gets necessary hardware in the troops hand in a timely manner. The Combat Support Systems SPO AAC/WMO has purchased several products in this manner, the FFA 400, the ARTS Platform, etc. I think the best example to this approach is the Predator program. Limitations to the program would be items that blow-up such as rockets and missiles, due to troop safety issues. All support type equipment should be considered for EA.

I think a critical aspect of any successful business arrangement is that it involves benefits for both parties (Government and Industry) over a sustained period of time. Therefore, inherent in the EA process is the acknowledgement of ever changing requirements/technology/sustainment over a specified period or LIFE of a system/item. Establishing long-term relationships that will reward Industry for their ability to

demonstrate greater creative flexibility through long-term commitments is a good start. The Government needs to leverage off of competition to establish and promote this long-term relationship that can also ensure that during the EA process/changes, Industry receives healthy/fair returns in profitability but it does not become a climate for competitive buy-in with recouptment of potential early losses/low profits through the requirements growth inherent in EA. Average unit affordability goals/requirements are a method of establishing price goals that will establish parameters for both Industry and Government to formulate the EA strategy for requirements implementation. If a complete list of requirements equals a units price of \$XXXX and a schedule of XXX months/years; then EA merely divides the requirements into segments which grows the price and schedule to the (traditional) end goal while providing early fielding of these subset requirements/capabilities. The key will be allowing industry to determine the subset of requirements they optimally can field in a given time/price and getting Warfighter buy-in of industry's planned implementation phases. Also it becomes increasingly more important to obtain total system warranties to minimize the logistical impacts this iterative fielding of configurations will have on the cost of the systems. We must be flexible enough to allow industry to capitalize on their strengths so that each competitor/offeror does not have to meet identical segments of requirements but uses a Cost/Schedule as Independent Variable(s) to determine what requirements they can implement during the perspective EA point/phase.

To do this effectively, I believe we need to carry our competitive efforts further through the acquisition cycle to promote more accountability/competition to meeting schedule and price commitments. Establishing Goals of average unit procurement prices

for each EA Phase that is also contingent upon meeting schedule has been used in various long-term pricing arrangements. These long-term pricing arrangements demonstrate the Government's ability to sign up to a long-term need/commitment while providing Industry the ability to leverage off of commercial partnerships to meet our price/schedule goals. The Government must be willing to commit funds to support XXX quantities of each EA configuration to support Industry's profitability and support cost responsibility of production start-up, warranty, etc. Failure of the Government to make these commitments upfront and keep them will make affordability/schedule goals difficult to obtain from Industry. Competition increases the need for Industry to meet their commitments to gain the benefits of a long-term business arrangement.

To me, the success of EA is dependent upon a stable, long-term relationship with the supplier. At Eglin, we've been using long-term price agreements (LTPA) which is a bilateral agreement between the Government and a prime contractor in which an obligation is made from the Government to exclusively buy a supply or service from the prime contractor in return for an obligation to meet long term price, quality/performance, and schedule commitments. As used here, LTPAs are binding agreements enforced through a contract clause that is structured with positive incentives to reward the contractor for meeting his commitments. LTPA clauses include remedies in the form of negative incentives if the contractor does not meet his LTPA commitments.

---Examples of positive incentives include removal of the requirement for certified cost and pricing data, contractor configuration control, and contractor logistics support.

--- Examples of negative incentives include requiring the contractor to qualify a second source at his own expense, liquidated damages, or the re-establishment of certified cost and pricing data.

Evolutionary Acquisition (EA) or Spiral Acquisition is more of a philosophy than a defined process. It encompasses getting a needed, available capability fielded now in full anticipation that improved capability will be available in the future. For example, the F-18 and F-16 aircraft have far greater capability today than when they were introduced, as do most weapon systems and support systems. EA has perhaps always been with us to some extent. Implementation however, has had many incarnations. The most common method of implementation is an Engineering Change Proposal (ECP) for an existing system. ECPs may be requested by the Government or submitted by the contractor. This method has been fairly successful over the years, but is not particularly fast. Another common method is a Pre-Planned Product Improvement Program (PPIP), wherein system improvements are anticipated and a method for funding further development is in place. The Advanced Medium-Range Air-to-Air Missile (AMRAAM) is an example of this method. The Small Diameter Bomb program intends to initially field a weapon that is effective against fixed targets, and later add the capability to engage moving targets, thereby getting some capability fielded sooner. Recognition of, and provision for, Independent Research and Development Programs (IR&D) by defense contractors has also yielded fair results. Early and continued involvement by current and potential suppliers by any means is key. Rules providing for Acquisition for Test and Experimental Purposes (AETP), wherein a test quantity of a given item can be immediately acquired without competition, have aided in rapidly establishing military applications for

commercial or other existing products, bypassing a lengthy development cycle. These acquisitions sometimes result from market research or a suggestion only. Use of FAR Part 12 rules for commercial acquisition can also quickly inject rapidly evolving technology into the field.

With AMRAAM, we have a development and production team (contractor and government) that work together as one unit to plan and implement new capabilities and technological advances in the AIM 120 missile. I will step through some of the contractual/business practice changes that we have undergone to get to where we are today. I see no reason why some if not all of these practices can't/shouldn't be used to implement EA programs.

In 1997 AMRAAM faced:

1. Shrinking US annual procurements
2. A massive infrastructure cost (only about a third of the budget went towards actual purchases of missiles)
3. Mandated manpower reduction
4. Loss of Competition from AMRAAM producers

In 1998 AMRAAM responded by:

1. Consolidation of Development, production, and Repair at one Raytheon facility
2. Teamed with Raytheon to Implement Commercial Business Practices That
 - Saved 28% (\$590M)
 - Reduced Manpower by 30% - 2 yrs early
 - Reduced infrastructure costs - Over 75% of AMRAAM budget spent on missile

purchases

-Established a 10 Yr Cost Control Strategy

Recently AMRAAM has again responded by

1. A results oriented payment Procedure - Performance Based Payments on all Firm Fixed Price (FFP) contracts
2. A focus on Price Based Philosophy - a shift away from concentration on profit control alone
3. Implemented a Price Based Acquisition for AMRAAM Production and CLS Acquisition Integrated with Production (CAIP)
4. Became a PBA Test Bed Program
5. TINA Waiver - to waive the requirement to obtain cost or pricing data
6. Increased/Expanded Use of Long Term Pricing Agreements (LTPAs)
 - 02-07 Missile Pricing Model for various configurations (with various software changes) and a large range (350 - 1200 missiles)
 - 02-07 Repair Pricing Model for any type of repair associated with the missile and its missile related equipment.
 - 02-07 Non-Developmental Item Airborne Instrumentation Unit (NDI- AIU) Pricing Model. This is a new sophisticated, missile telemetry development to replace existing AIUs.
 - 02-07 Price Agreements for other items (spares, specific tech spt, warranties, offset admin costs, etc.).

How'd we do this? We took a fresh look at how we conducted business, and began "Vision 2000", instituting a Total System Performance Requirement (TSPR) type

philosophy. In short, the contractor agreed to perform the tasks that he deemed necessary and sufficient to develop, deliver, warrant, and support affordable combat capable and readily available weapons systems; the government agreed to define and communicate performance requirements, provide the requisite resources, support a long term pricing strategy, and enable contractor activities.

Some of the Key Business Elements Are

1. Contractor Control and Verification of the Product

- To do this; we developed a system performance spec, and allowed the contractor make all changes below the upper level spec (i.e. changes that do not effect performance). A result of this was a reduction in govt. specs from 370 to 2.
- System Performance Spec Maps directly to the ORD.
- Conducted Task Designation Analyses In other words we sat down and identified all of the tasks involved with the missile, then, with a TSPR approach in mind, decided what made sense for the contractor to do and what would remain a govt. function (task designations).
- Contractor Responsible and Accountable, with Government as an Enabler.
- NOTE: under our TSPR approach, the Government never abandons overall authority/responsibility, and may change the agreement with respect to degrees of authority/responsibility as needed.
- Contractor Takes Configuration Management

The shift to contractor control led to:

1. Raytheon synergy across the Tucson facility.

Pricing/Affordability

LTPAs (previously discussed)

Price Commitments and a Cost As an Independent Variable (CAIV) process for the P3I C7 missile. As production continued on FFP contracts priced contract with an LTPA in place for the B version missile and the production C versions, the development of the C7 went into place with a Cost Plus Award Fee CPAF contract. The incentive portion involved a CAIV approach and a joint factory pricing model, incorporating increased lethality and capability improvements while keeping within the threshold requirements and the contractor's price commitment.

2. As we moved toward Price Based Acquisition (I'll discuss in detail later) we were able to use the CAIV model and price commitment to help establish price reasonableness for a FFP contract without the use of (certified) cost or pricing data for the 02-07 production missiles. I see no reason why this approach would not work in an EA scenario where functionality can be assessed; performance criteria used, and as spirals are implemented, shift from FPIF or CPIF/CPAF arrangements to FFP arrangements.
3. Incentives for Contractor
Direct Commercial Sales (DCS) - The contractor was able to seek DCS instead of FMS sales for missiles. However, the pricing model used on the AMRAAM FMS/US contract would achieve a price benefit from such a sale.
4. Source of Repair - The contractor was determined the single source of repair, and could thus achieve synergy/savings by having both repair and production in the same facility.

5. Self-Oversight - Working with DCM offices, we put Raytheon in charge of quality, going to contractor self oversight. Essentially, when Raytheon felt that an item was ready for delivery, they would conduct their own quality checks and self certify on the DD250. This removed a layer of DCM oversight. This program has continued to be very successful.
6. Flexible Contracts That Look at a Team Win-Win Approach

Review-Discuss-Concur (RDC) This is a method of negotiation whereby the govt. and contractor jointly review a need or requirement, scope the requirements (discussing all assumptions and issues, discuss task level cost/price as necessary, then agree on a bottom line price prior to submittal of a proposal.
7. Flexible LTPAs The long term Production/Sustainment models discussed were put in place to provide program stability, but also are written to accommodate for configuration variations, quantity changes, as well as customers who come along after the initial award of a production run. We can capture those additional requirements and pass price reductions to all, enabling the US to buy more missiles within the same budgeted dollars.
8. Performance Based Payments (PBPs) on all FFP Contracts A change from progress payments to a focus on performance and value. Currently, we have developed quarterly PBPs that are easily managed, which benefit us by less expiring funds issues and closeout issues, require less Defense Contract Management Agency involvement, and provide a larger, positive cash flow to the contractor.
9. Options

Expressed as part of a Package Deal. The option language is written to reflect that

the options (which include the long term agreement) are part of a package deal strategy; this, with shift to PBA, attempts to focus on each contract action as a part of a larger negotiated agreement, not a series of individual actions, and individual profit reports.

10. Established as a Clause, not a line item - Option language in a special clause of the contract describes the LTPAs and all terms and conditions of the option.
11. Since options become line items only upon their exercise, the line items are less confusing, less troublesome for finance, and lead to smoother/quicker closeout (line items do not remain in the automated systems).
12. Exercise of options as either modification to the current contract or as a separate contract. Exercise as a separate contract leads to smaller contracts, less line items, less confusion with regard to payments, etc, which in turn leads to faster closeout.
13. Alternate Disputes Resolution (ADR) a process whereby a system is set up between the parties to resolve disputes. AMRAAM has never had to use it, thanks to the successful teaming we have experienced with Raytheon.
14. Electronic Data Sharing/Open Books - Raytheon and the government are very open with regards to all data, and most of this data is shared electronically. The government is able to be present at Raytheon meetings, and likewise Raytheon is present at govt. meetings (Example: All Raytheon financial data is shared, JSPO representatives can sit in on Raytheon business/financial meetings, Raytheon attends JSPO Budget Control Boards, etc).
15. 10 Yr. Bumper-to-Bumper Warranty that is Rolled Forward - Clean simple language that covers the missile excluding certain Acts of God or misuse; the warranty is then

moved each year to the most current contract warranty accountability clause, so that older contracts can be closed out.

16. Roll Forward of GFP - Same as warranty roll forward; Accountability of GFP is transferred to the most recent contract so that closeout on older contracts can be accomplished.

17. Simulation and Testing not contracted separately. Raytheon in charge, and subcontracts simulation and testing, including any Govt. ranges or test facilities.

18. Price Based Acquisition

In 2000, AMRAAM was selected as one of 3 Price Based Acquisition Test Bed Programs

19. Truth-In-Negotiations Act (TINA) Waiver - Using historicals and other pricing data points, pricing techniques were put in place to price the existing missile configurations, repairs and other production and Sustainment/CAIP items, as well as the P3I C7 version. These pricing techniques were put forth in a waiver from the requirement to obtain cost or pricing data, and approved by Ms. Druyun on 09 Jul 01.

20. Focus on the Package Deal - In the past, as the contractor was able to creatively save money in any 1 year (negotiating better subcontracts, finding areas of product improvements that saved money, etc) the following year's price reasonableness assessments, profit reviews, or audits, etc, would effectively penalize the contractor through reexamination of profit in option yrs, thus stifling funds that could be used for improvements by the contractor. By focusing on price, and away from individual cost elements and profit, negotiations are streamlined even further, and the government still obtains a fair and reasonable overall profit which can then be

assessed jointly in terms of the package deal. This allows the Raytheon Missile Group to keep dollars and reinvest in AMRAAM instead of giving the dollars over to corporate or having profits cut by the govt.

21. Justification and Approvals the Joint Systems Program Office has a Class J&A approved for all production, sustainment/CAIP, technical support, and development through 2007. I would strongly urge that any EA development linked with existing (or soon be) program does likewise, so that multiple J&As are not sought.

Table 2. ASC Responses to Round 1/ Question 1

What contracting/business arrangements do you think worked (or will work) in supporting an evolutionary acquisition (EA) strategy? Provide an example if possible. 5 of 5 panelists responding

Omnibus contracts, with broad scope spanning many years with large ceilings. My particular experience has been with multiple award ID/IQ contracts. These ID/IQ contracts were awarded with both large and small businesses in the Training SPO. Use of the fair opportunities clause allowed us to compete awards within a "limited pool of competent contracts". This saved both time and resources. Terms and conditions were also already approved and awarded - allowing CO to issue individual delivery orders for each requirement. These contracts are called TSA1 and TSA II and more information can be provided on these if need be.

We are currently in the process of putting in place a contract that will give the capability to the program an overarching contract. This will enable the team to do EMD, production enhancement, ICS, integration of known and unknown platforms into the

Joint Helmet Mounted Cueing System (JHMCS). This will include also efforts to add the Panoramic Night Vision Goggles onto the helmet. We will cover configuration management logistics, sustaining engineering; studies and analysis, to only name a few. The contract supporting the JHMCS requirements will use multiple contract type arrangements. This affords maximum flexibility for the JPO to tailor the contract type to cost technical and schedule risks as appropriate for the specific effort to be performed. There are plans to establish line items with cost plus award fee, cost plus fixed fee, firm fixed price, fixed price award fee and time and material arrangements. Given the requirements and future funding uncertainties, a hybrid ID/IQ contract will be awarded. This will give us the greatest flexibility in both quantities and delivery scheduling which is essential because we cannot determine the precise quantity or delivery of upgrades/enhancements tasks that will be required during the contract period. Also because we have many platforms (F-15, F-16, F/A-18, FMS and eventually F-22) participating, there may be changes peculiar to a platform, therefore, we will only do a D.O for that platform.

At the B-2 SPO we have a process called Diego. It is an iterative approach to the acquisition process that front-loads much of the acquisition planning and contract posturing prior to receipt of proposal; we would essentially have a "hand-shake" agreement upon receipt of proposal. This process significantly reduces the contracting lead-time to get the project awarded. This process has been in place prior to the current thrust of Agile Acquisition.

My thoughts are initial; however, with spiral development, much more thought needs to go into how we are going to enter into contracts for overlapping requirements. Those

items which need careful scrutiny are funding, Earned Value Management Systems, Contractor Performance Reporting, and how well equipped the contractor's accounting, scheduling and managements systems work. It is too soon to measure the effectiveness of contracting in a spiral development program.

I don't believe there are any specific examples of a "successful" EA business strategy - -- It's too early yet. Additionally, there is really nothing "new" or "magical" about EA. It is just a different packaging of the pre-planned product improvement (P3I) programs of the past. Another way of viewing EA is as "pre-planned" program concurrency. There aren't any new/radical business approaches required to implement EA. In my opinion, the contracting/business strategy is driven by the requirements definition process --- i.e. getting the user to plan/accept "incremental" steps/spirals in capability while working toward a desired end-state. The single biggest contributor to the success or failure of EA is still contractor performance, not the contracting strategy or business arrangement --- we tend to forget that important fact in our rush to be "innovative".

We have used EA in numerous acquisitions, some by design, some by default. By default, it has occurred when the ORD required far more capability than could be procured for the budget. In those instances, the requirement was downsized and an initial increment was procured to provide some minimum capability. The downside was that, since it was EA by default, there wasn't a well thought out long-term strategy to achieve full capability. In the last couple of years, more acquisitions have been using EA for their long term planning and strategy. An example is the Large Aircraft Infrared Counter-Measure (LAIRCM) acquisition, procured through the GR program office. An initial minimum capability was procured along with a minimum number of production units.

Planning for incremental improvements and achieving full capability was part of the process. A Fixed Price incentive type contract was used. Another example is the Panoramic Night Vision Goggles (PNVG) acquisition. Initial capability will be for fixed wing, non-ejection seat capability. A following increment will include ejection seat capability, etc.

The common thread in all of these is competition up front to lay out the best overall strategy and value for the Government, followed by the award of a competitive contract that allows for maximum flexibility. For example, you don't want priced options for each increment up front, because you don't yet know the results of the initial effort. Test results, feedback, etc. must be part of the following increments.

Table 3. ESC Responses to Round 1/ Question 1

What contracting/business arrangements do you think worked (or will work) in supporting an evolutionary acquisition (EA) strategy? Provide an example if possible. 6 of 6 panelists responding

Definition of the evolutionary increments, at least those well defined at time of award, if necessary. For Global Transportation Network 21 (GTN 21), there are 2 incremental deliveries of the system as well as a separate delivery of a data warehouse. Without this strategy, the government would have to await a successful FOC before "turning off" the currently fielded system. Under this strategy, a fieldable system has been defined as the IOC increment and delivery of that system, well before FOC, will allow the government to turn off the current GTN system and start to utilize the new technology. There will be obvious savings in the area of support of the old system.

The program I was on, which was initially designated (it is not now on the program) a pathfinder program, has recently transferred to another PCO. Unfortunately, I will not know the end result of the unique contracting approach this program has taken. This is the most unique business arrangement I have seen in my career.

This contract was written as a "typical" Pre-EMD effort, Cost-plus Award Fee contract except for one thing. The Award Fee Plan is far from "typical". The business arrangement is as follows:

- 1) 3% Base Fee - \$7.8M
- 2) 6% Traditional Award Fee - \$15.3M broken out in six evaluation periods
- 3) 6% Teaming Fee - \$5.3M - broken out by FY for four periods and obligated at the beginning of each FY.

Item #3 is pretty interesting. The teaming fee is subject to semi-annual SAE/CEO reviews - feedback to the contractors relative to teaming effectiveness. This is done prior to the release of the teaming dollars for that FY. The teaming fee is tied to Milestone B decision. "In the event the FDO distributes teaming award fee prior to Milestone B and the subsequent decision at Milestone B is "Teaming Relationship Ineffective", the Government and the Contractor agree that the teaming award fee distributed prior to the decision shall be returned by the Contractor to the Government with interest." I am not sure if this is the kind of thing you are looking for, but I do know this is getting a lot of attention right now. Please let me know if this helps.

Single Process Initiatives - Development of common items for various services, programs, etc. spreads development costs thereby lowering overall cost of the program. There are numerous examples, try contacting DCMA for a few.

Joint Program Offices - Again, this spreads the cost of programs among the services thereby reducing costs to each service while minimizing overhead.

I am contracting officer on the Theater Battle Management Core Systems (TBMCS) program, which uses an evolutionary acquisition (EA) approach. The contract is primarily cost plus award fee (CPAF) and allows for issuance of Technical Task Directives (TTD). TTDs provide for flexibility and quick contract modification when requirements change or subsequent increments of capability need to be placed on contract. The contractor (Lockheed Martin) has Forward Pricing Rate Agreements (FPRA) in place, as a result proposals primarily involve negotiation of labor mix and hours and, using a one-pass process, are usually settled and placed on contract quickly once requirements are known and funding provided. This has proven to be a flexible contract vehicle - and flexibility is essential in an EA environment.

There are many possible ways to contract for EA depending on how well you can define your requirement. Software development lends itself to this process. Software usually is developed in increments or blocks and can be defined in functional terms. Contracts can be designed with multiple priced options for incremental delivery of added functionality. Time and Material or Cost type level of effort contracts often lends themselves to this type of acquisition. Cheyenne Mountain upgrades were initially contracted for in predetermined blocks and phases. It was recognized that software is always being debugged/maintained or improved and is a perfect candidate for EA. Planned drops are now contracted for to continually improve the system. Hardware can be more difficult to contract for under EA. Planned ECPs, P3I or other strategies can be utilized. If we were attempting upgrades with production dollars we would have to

negotiate fixed price ECPs or upgrades on a preplanned basis. It would be difficult to have pre-priced options with many unknown variables.

What we wanted to do was to provide as much flexibility as possible in the contract, so that we could go back and define the future evolutions as we learned more about what they should be, without having to continually go through the initial acquisition cycle of internal approvals through the acquisition strategy process (acquisition plans, justification for sole source, etc) We wanted to be able to start right in working with the selected contractor to begin each new cycle (evolution) as soon as we had enough information to begin discussions. The problem is that you have a general idea of where to go, but only specific information about the first part. We needed a contract scope broad enough to cover future known unknowns. For example, on one contract, we needed to eventually incorporate a list of 200 developmental items, but we only knew what the first 20 or 30 would look like and which ones they should be. We needed contract flexibility to continue adding future items from the list (the known part), but without knowing which ones would be next or what they would be like (the unknown part). So we added the entire list of 200 items, defined those we were starting with (price, delivery dates, technical requirements, etc), and added language that would allow us to work the rest of them later. This made all 200 part of the scope of the contract, but the details would be worked out along the way.

Aside from flexible contractual documents, I found that we had to look at contract types in a different way. On Joint STARS (the program that Carol is referring to), we used Fixed Price Labor Hour to accommodate post development spirals (where cost contracts would be impractical). Performance milestones are also key to ensuring a

usable deliverable when not using a classic contractual setup where FFP means a firm deliverable and FPLH may not. I found that you have to write the vehicle in such a way that you ensure a deliverable, yet allows the contractor to continually incorporate spirals. The contractual vehicle worked very well in the JSTARS program and we were able to field software that benefited from using an adaptable contract. Selling a broadened outlook on the contract types and writing the vehicles in such a way that you were able to realize the deliverable was a tougher sell through the Government than through the contractor, who actually flourished under spiral enhanced contract vehicle.

Table 4. AAC Responses to Round 1/ Question 2

What constraints (statutory, regulatory, business practice, financial etc.) exist in implementing EA and how can we (or have you) overcome them?

6 of 6 panelists responding

The Government is its own worse enemy. We all want to implement EA, but in the constraints of the old way of doing business. We need changes in the review processes, more flexibility to team or partner with industry concerning new technology exploitation (maybe relaxing set-aside and competition requirements in these type programs). Budgeting and other financial issues always end-up driving the type of procurement. We should allow FM folks, at the local level, additional flexibility to fund programs and innovations in a more timely manner. If a program using EA is progressing well, reward the program with additional money to speed up the production buy and/or approach a 100% solution. Put the decision making process down at the Base level to the extent practicable. Too many chiefs in the approval process. Give the lowest levels, from the PM on down, the flexibility to be more innovative. I believe the Logistics functions are

still too wrapped-up in the old processes. Meeting MIL STDs, TOs, and data CLINS are great on weapon systems and platforms (from a safety standpoint), but for support systems and equipment, I feel that these things can be relaxed more than they are now. In acquisition, we have focused to buy everything in a "commercial" manner using part 12, or combined 12 & 15, procedures. We need to realize that one size fit all approach doesn't work that well. If the item is clearly military in nature, don't try to force a commercial solution. Chances are, you will only end-up with a mess to administer. The Gov't needs to clean up the DFAS problem. Contractors are not being paid timely, thus creating additional contingency fees in future efforts and in some cases actually limiting competition (from contractors refusing to do business with the feds).

One of the biggest challenges any acquisition office faces is sufficient and appropriate funding for executing the approved EA strategy. Therefore, given the inherent nature of concurrent development/production that will be ongoing in the EA process and the need to have greater flexibility to accommodate contractor's changes; the Government needs to rethink appropriation laws and provide a total FY budget that is authorized for the EA Program without specificity of type of funds (i.e. R&D, Production, O&M). The funding could still carry a year designation, and measure obligation/expenditure of funds, but specific use of the funds would become the responsibility of the PM based upon successfully executing the program against the stated milestone/objectives in the APB.

Additionally, the area of individual accountability must be increased so that programmatic success and ultimately customer satisfaction is the goal of everyone that influences the outcome of the program (DCMA, DFAS, Air Staff, program office, industry, etc.). Use of personnel performance reports/incentives/pay and Industry's

personnel rating/performance incentives/pay to demonstrate individuals' success being dependent upon program/mission success is needed. This will encourage more empowerment to the lower levels and encourage members of both industry and Government to find solutions to constraints that are mutually beneficial.

The biggest obstacle we found to evolutionary acquisition came not from the Air Force, nor from regulatory or statutory constraints - the biggest obstacle we have encountered is the using command. The Small Diameter Bomb program is in the Concept and Development phase of acquisition. We sold a fixed price contract concept to OSD (AT&L) by showing that the risk to the contractors was minimized due to a draft ORD with only two key performance parameters, and that all other requirements were tradable. Our program was structured to get the 80% solution to the war fighter in a very short time (41 months from award of the CAD contract to the time the first LRIP units were fielded), with a well-defined spiral laid in for the subsequent production lots. Unfortunately there were personnel changes at ACC between the time the ASP was held and right after contract award. With the change in personnel, all previously agreed-to strategy for spiraling capability went out the window. Although ACC has accepted some trades, they have come right out and said that they don't agree with spiral development because they want all the capability up front, and, to make matters worse, they have actually added requirements. This isn't unique to our program.

Statutory, regulatory, business, and financial constraints to any kind of Government acquisition abound. This is not all bad because, unlike a business, our Government must serve many masters, not always with a profit motive. That said; let's look at the most common constraints in Government acquisitions.

FINANCIAL: The appropriation, budgeting and accounting process is long, uncertain, and complicated. Funds have restraints as to what they can be used for and their useful life has limits. Stable funding and broader permissible use of available funds would be a good start in adding flexibility to the evolutionary acquisition process. Spiral development, by its nature, is uncertain in its ultimate outcome. We must embrace this uncertainty as an opportunity to field new capabilities as they become available and need maximum flexibility in the use of funds.

STATUTORY: The Competition In Contracting Act (CICA), The Small Business Act, and the yearly appropriations and authorization acts most commonly affect the Government acquisition process, although statutes by the hundreds come into play. The above-mentioned statutes can (1) Determine what you can buy, how much, when, and sometimes the sources; (2) Require delay in acquisition to advertise requirements and seek competition; and (3) Require the Government to consider and assist certain category businesses.

REGULATORY: The Federal Acquisition Regulation (FAR) implements statutes, codifies policies, and otherwise prescribes how the Government will acquire goods and services. This is a necessary and good idea. It provides order and sets expectations for all parties in the acquisition process. It may, however, be too much of a good thing. In any case, it is plenty sufficient without any supplements to further restrain the process. As with most regulations, it's a one-size fits all proposition. Specific language limits flexibility in execution. Among the most onerous, yet I suppose necessary, regulations encountered involve reviews and approvals. This is perhaps THE most time consuming and counterproductive administrative burden in the whole acquisition process. The end

result is always different, but not necessarily better. I advocate no more than one intervening level between the worker and the final approval authority - ever.

The legal and regulatory ease of protesting - and stopping - a contract action is something with which businesses simply do not have to contend. There is nothing that can be done about these constraints at the working level, but they are deserving of a closer look at the legislative, and executive levels.

BUSINESS PRACTICES: The Government must become more results oriented and less process oriented. This applies to both administrative and technical aspects of acquisitions. For instance, the Government probably doesn't need any data not already produced by a contractor in the course of his business - and his format is likely to be acceptable, so why not simply accept whatever is provided to commercial customers or, in the case of a defense contractor providing a weapon system or other military specific item, have a data accession list delivered and get copies of whatever on that list is desired. As for performance and testing, the Government should provide any Government specific facilities (test ranges, etc) required, witness demonstrated performance, and that's all.

Maximize use of FAR Part 12 in and the simplified acquisition process in acquisitions J&A. However, there is no reason why these J&As cannot be streamlined into a 1 or 2 page document, since they are limited in how they are able to vary.

DT with OT One of the biggest challenges

Acquisition Strategy Panels/Acquisition Plans - AMRAAM has a Program level SAMP that is comprehensive so that no AP is required; the ASPS are structured so that

the team develops the strategy, with the program manager and contracting officer as the focal point.

Subcontracting Plans. The need for individual subcontracting plans is suspect. Raytheon is part of a Test Program that does not require individual gathering/reporting of subcontracting information by individual subcontracting plan.

GFP - Still progress needs to be made on why, for long term sole source production/development the government insists on keeping/maintaining gov't property. An arrangement by which the contractor could take possession of GFP seems in the government's best interest.

Funding

-Concentration on the collapsing of certain related fund cites into one so that funds can be administered easier.
-Types and Use of Funds (3400 vs. 3020, 3010 etc) and funds availability. We have been compelled to look at phased type funding for some of the requirements within AMRAAM, whereby we identify a portion of a body of work or deliverables that are of tangible use to the government, and the contractor accomplishes this work in phases.

One Stop Shopping

Two major themes need to be addressed. CICA and Small Business regulation. With one stop shopping, a contractor can be in control of his/her own destiny. Working in a good teaming environment, he will seek to make those business arrangements with quality, competent subcontractors who can ensure the viability of his product in the marketplace. In theory, he will still employ small, small disadvantaged, and woman owned businesses that serve him well. The problem is that this drives down prime

competition percentages and prime subcontract goals for the Air Force. Perhaps the key is to allow such reporting at the subcontract level as well, and provide Large Businesses more incentive dollars to develop and contract with Section 8A/SDB/SBs.

Table 5. ASC Responses to Round 1/ Question 2

What constraints (statutory, regulatory, business practice, financial etc.) exist in implementing EA and how can we (or have you) overcome them?

5 of 5 panelists responding

Number one in my opinion would have to be contract-financing issues. - Not only availability of funding, but timing issues as well as colors money. It has been my personal experience that many times the government takes the time and effort to compete and or negotiate fair and reasonable prices, only to be unable to execute due to funding constraints. A close second would be changing requirements. How often have we priced something only to have to reprice due to changes.

Finally, I would close with CICA, fair opportunities clause and small business issues.

Right now we are working with the IPT (Boeing, Subcontractor and JPO) to get all potential issues on the table. Once we have determined issues we will engage JAG to review the potential issues. At this time I am not aware of any statutory issues that will impact our strategy, however, we are waiting to get guidance from the PEO office as to what the rewrite of the AFFAR will have on us.

We face multiple constraints on the Radar program. The two primary barriers are affordability and the lack of obtaining the Congressional New Start. (a) The affordability issue is being addressed on multiple fronts but we are running out of valuable time due to

a future need date for operational availability. The SPO/Northrop Grumman have pricing options on the table but the lesser (\$) of the two gives the user lesser operational capability. Component breakout (DFARS Appendix D) to Raytheon in the System Development and Demonstration Phase is another option that is being considered for cost reduction. (b) Before any contractual authority can be given to the contractor to execute this program, a New Start must be issued. This has tied our hands somewhat for proposal preparation and planning. Upon receipt of the New Start authority, we will be postured to award the Radar contract; a sooner than later New Start would greatly benefit the program's ability to effect a quicker contract award thus safeguarding the operational need date. (c) One streamlining initiative the B-2 has submitted as a time-saving measure that supports the Transformation tenants is redesignating the B-2 Radar Pathfinder Program from an ACAT ID to ACAT IC with Milestone Decision Authority redelegated to the PEO.

The initial contracting method of Other Transactions can be useful to attracting competition and expediting concepts; however, one must guard against teams believing that subsequent contractual actions will not be FAR based, or may not know what FAR based contracts require. Transitioning from one type of contracting (OTA) to FAR based contracting is somewhat of a cultural change. I believe some education would/should have been accomplished in the transition. One caveat: I'm looking back with 20/20 vision. Those involved did not and do not now have the luxury of time for this type of insight.

The biggest constraint we have to effectively implementing any approach is the financial/statutory hurdles tied to funding. We could do a lot of unique/different business

arrangements if our current funding constraints were reduced/eliminated. Some recommended changes include:

- a. Fund by Spiral --- That means any activity required in that spiral (i.e. development, long lead, production or sustainment effort) is all funded by one (1) type of money --- i.e. 1 fund cite.
- b. Provide greater flexibility in use of incremental funding --- allow program office to decide when incremental funding is appropriate.
- c. Extend the time that funds are available for expenditure prior to going into "cancelled" status.

Funding is the most difficult constraint. Often times there is not enough in the budget for the requirement and the yearly budget doesn't match the contractor's spend plan. Again - flexibility is important.

Long term contracts are often mentioned as beneficial to EA, however, contractors tend to perform better when they know they must compete for follow on effort. Therefore, incentives such as award fees are extremely important to encourage the contractor to deliver results. Another tool often used up front is to award contracts to two offerors for the risk reduction effort. This helps generate creative solutions and energizes the contractors to be proactive in developing a successful long-term strategy.

Table 6. ESC Responses to Round 1/ Question 2

What constraints (statutory, regulatory, business practice, financial etc.) exist in implementing EA and how can we (or have you) overcome them?

6 of 6 panelists responding

I suspect that there may be some issues relating to defining an end item, which the Government could pay for, which could at times impact an EA strategy. There may be some resistance to defining certain increments as such. I have not had that experience. Nor have I experienced a business practice thus far that couldn't be overcome. Financial issues can be the bigger problem. This isn't an issue specific to EA though. Too often a budget dictates our requirements or strategy when the budget should support the requirements with a strategy complimenting it. Unfortunately, we are often constrained by the budget, whether it is total dollars, annual appropriations or type of funds.

I have a hard time answering the second question. I was not there in the beginning of this acquisition. I believe Ms Druyun played a strong role in the creation of this business arrangement. The team includes Northrop El Segundo, Northrop Baltimore and Northrop Melbourne and Raytheon. I don't believe there were any statutory issues. The only "financial" issue is the return of funds should the contractor fail - which I cannot imagine happening - guess we will wait and see.

Layers of approval - USAF ORD process is cumbersome. It can often increase the time lag from concept development to fielding a system. In many cutting edge technology systems, the edge can get "dull" if it takes too long to field.

Color of money is always a problem, however it seems that recently, the reprogramming process has grown more user friendly.

There are many constraints - here are a few. Need to regularly negotiate labor rates/request Defense Contract Audit Agency audits can be overcome when FPRAs are in place. Funding issues - both "color" of money and fund type - are constraining. CICA is

an issue and must be addressed at program commencement when writing the Single Acquisition Management Plan and the basic contract. There still is a bureaucratic-risk aversion mentality prevalent, which leads people to want all requirements known and all risks mitigated before proceeding. It is difficult to get EA programs budgeted due to out-year requirement uncertainty and this leads to constant funding challenges.

The main constraint that I can think of is CICA. EA can be construed as a method of avoiding new competition. Open system architecture makes a good case for re-competing future evolutions, which could introduce fresh ideas. In order to comply with CICA, a program office may have to process Justifications for Sole Source based on the proprietary nature of the existing data. This could possibly be avoided if the original synopsis/competition/J&A/Acq. Plan or SAMP properly addressed the EA approach. The difficult part would be structuring the contract with special clauses, CLINs etc. to accommodated this approach.

The main constraint I ran into was the typical lack of knowledge of, or delay in incorporating, something new. The statutes are issued at a high level without a lot of detail, and when I was doing this; the regs hadn't gotten around to figuring out what that detail should be. Under general guidance, the team wrote up a program they thought would suit their needs, but there were constant roadblocks throughout the review process due to the lack of specific regulations to follow. Many reviewers would look at existing regs and say we weren't in compliance. It was a constant battle, and compromise, from those directing us to do something new, with those reviewing what we were doing

without updated regs to match. We ended up with a mixture of new stuff under some old rules. A little awkward, but workable. I can't answer about how things are progressing now that the regulations have caught up some.

The main constraint was the inability of our own staff to grasp something that was new and see how EA would actually realize a deliverable. I have found that allowing the contractor to work with less constraints actually produced a better product and working relationship.

Electronic weapons demand EA in order to be successful and capitalize on the latest technology. I believe the more of us who have worked with EA the easier it will be to grasp when trying to explain an acquisition strategy that incorporates classic contracting aspects in creative ways so to accommodate spirals and EA.

What contracting/business arrangements do you think worked (or will work) in supporting an evolutionary acquisition (EA) strategy? Provide an example if possible.

Four out of five respondents stated that stable, long-term, relationships with the supplier is a key to success in an EA environment. Early and continued involvement by current and potential suppliers was submitted by three members as a key to success. There were several suggestions that should be included as part of these relationships:

- 1) Three respondents submitted using Long-Term Pricing Arrangements (LTPAs) as part of an EA acquisition. These LTPAs are bilateral agreements between the Government and a prime contractor in which an obligation is made from the Government to exclusively buy a supply or a service from the prime contractor in return for an obligation to meet long-term price, quality/performance, and schedule commitments. They also suggested establishing goals of average procurement prices for each EA Phase in the LTPAs that are also contingent upon meeting schedule. These agreements are enforced through a contract clause that is structured with positive incentives to reward the contractor for meeting his commitments and remedies in the form of negative incentives if the contractor does not meet his commitments. Two members noted that these arrangements must be flexible to accommodate configuration and quantity changes.

- 2) Two respondents remarked that the Government must allow industry to define the subset of requirements that they optimally can field in a given time/price and getting the warfighter's buy-in of the industry's proposed implementation phases.
- 3) Another respondent noted similarly that the relationship must allow industry to capitalize on their strengths so that each competitor/offeror does not have to meet identical segments of requirements but uses Cost/Schedule as Independent Variables (CAIVs) to determine what requirements they can implement during the prospective EA point/phase.
- 4) One respondent suggested using a Total System Performance Requirement (TSPR) Philosophy. This philosophy encompasses a two-part arrangement. The contractor agrees to perform the tasks that he deemed necessary and sufficient to develop, deliver, warrant, and support affordable combat capable and readily available weapon systems; the government agrees to define and communicate performance requirements, provide the requisite resources, support a long-term pricing strategy, and enable contractor activities. Key attributes of TSPR that were submitted are:
 - a. Contractor control and verification of the product based upon a system performance specification developed by the Government
 - b. A system performance specification that maps directly back to the ORD
 - c. Sitting down and identifying all of the tasks involved with the system and then deciding what makes sense for the contractor to do and what would remain a government function

- d. Contractor responsible and accountable with the Government remaining as the Enabler and maintaining overall authority/responsibility
- e. Contractor controlling Configuration Management and quality
- f. Freely sharing data between the contractor and the government, electronically where possible.

5) One respondent defined the relationship as one that would reward industry for their ability to demonstrate greater creative flexibility while benefiting both parties (Government and Industry) over a sustained period of time. This relationship must acknowledge the ever-changing requirements/technology/sustainment over a specified period or life of a system. This relationship has the development and production teams work together as one unit to plan and implement new capabilities and technological advances.

Besides long-term relationships other business arrangement suggestions were also submitted. The suggestions include:

- 1) Two respondents suggested using FAR Part 12 rules to quickly inject fast evolving technology into the field.
- 2) One participant submitted leveraging off of competition to establish and promote a long-term relationship while ensuring that industry receives healthy/fair returns in profitability. This involves carrying out competitive efforts further through the acquisition cycle to promote more accountability/competition to meeting schedule and price commitments. The submitted benefit is competition increases the need for industry to meet their commitments to gain the benefits of a long-term arrangement.

- 3) Obtain a Class J&A for all of production, sustainment, and development of a system for a period of years to avoid continually going through the J&A process for each increment.
- 4) Obtain total system warranties to minimize the logistical impacts this iterative fielding of configurations will have on the cost of the systems.
- 5) Roll warranty and GFP forward to the most recent contract to allow easier contract closeout.
- 6) Commit the funds to support XXX quantities of each EA configuration to support the profitability and support cost responsibility of warranty, production set-up, etc...
- 7) Perform accelerated 1st Article tests and field the initial production units for 75% to 80% solutions. Let the end user critique and suggest improvements. Limit to programs where troop safety is a major concern. Include all support equipment under EA.
- 8) Use rules for Acquisition for Test and Experimental Purposes (ATEP) wherein a test quantity of a given item can be immediately acquired of a given item can be immediately acquired without competition have aided in bypassing a lengthy development cycle.
- 9) Obtaining a Truth In Negotiations Act (TINA) Waiver from the requirement to obtain cost or pricing data.
- 10) Instituting a Price Based Acquisition that focuses on price and away from individual cost elements and profit, negotiations are streamlined even further, and the Government still obtains a fair and reasonable overall profit can then be assessed jointly in terms of a package deal. This would avoid penalizing the contractor for

cost saving measures and reinvesting the savings back into the program. Using a Cost As an Independent Variable (CAIV) model and price commitment to help establish price reasonableness without the use of certified cost or pricing data on Firm Fixed Price (FFP) contracts.

- 11) One participant suggested that EA has always been with us to some extent even though its implementation has had several incarnations. The most common method of implementation has been the Engineering Change Proposal (ECP) which is not particularly fast. Pre-Planned Product Improvement Program (PPIP) is another method wherein system improvements are anticipated and a method for funding further development is in place. Recognition of, and provision for, Independent Research and Development Programs by defense contractors was also submitted as yielding fair results.
- 12) Use Performance Based Payments on all Firm-Fixed-Price (FFP) contracts that are based on results and value.
- 13) Shift from Cost and Incentive type contracts to FFP contracts once functionality can be assessed, performance criteria can be used, as spirals are implemented.
- 14) Treat options as part of a larger negotiated deal, not as individual contracting actions. Exercise these options as either modifications or as separate contracts to speed up the closeout process. As part of this process, establish a comprehensive options clause that outlines the terms and conditions of the option as well as the LPTAs that are incorporated.

15) Utilize the Review-Discuss-Concur team negotiation approach whereby the government and contractor jointly review a requirement, define the scope, terms and conditions, and agree on a bottom-line price prior to the submission of the proposal.

What constraints (statutory, regulatory, business practice, financial etc.) exist in implementing EA and how can we (or have you) overcome them?

Four of the five participants replied that funding was a constraint. Members submitted that the responsibility/authority for the control of funds should be placed at the Program Office level to create flexibility for a program. In addition, three members mentioned that the color of money complicated things and that one fund cite would speed up the process. Two respondents noted that sufficient and appropriate levels of funding are essential to implement an EA strategy.

Three out of five participants submitted that the set-aside requirement for Small Business impacted their programs. The validity of requiring subcontracting plans was questioned. One possible solution submitted was incentivizing large businesses to develop/utilize small businesses. Another respondent suggested giving the prime contractor the flexibility to use those small businesses that have proven to be valuable partners.

Three out of five participants identified the review process as a barrier. Too many approval layers, as well as cumbersome processes, were presented as problems. One person suggested that our current review process is a counterproductive administrative burden. The suggestion was made to never have more than one intervening level between the worker and the approval authority.

Three respondents also identified the Competition in Contracting Act (CICA) as being a barrier.

Two participants responded that the government's involvement in performance and testing was counterproductive. The suggestion was made for the government to provide the testing facilities and equipment as necessary and observe the test and nothing else.

Singular responses also included:

- Allowing more flexibility in teaming/partnering with Industry
- Ensuring contractors are paid on time
- Make it more difficult to protest and stop an acquisition
- Increase individual accountability by tying program performance on both sides to individual performance reports, compensation, and bonuses
- Increasing the cooperation of the using command (turnover at using command causes continuity challenges and changing of prior agreements)
- Eliminate the DFARS and AFFARS because they are too restrictive
- Change the government from being process oriented to results oriented
- Require only the data that commercial customers would receive
- Transfer GFP on long-term, sole-source contracts to the contractor instead of maintaining it ourselves
- Revamp the J&A process to permit class deviations when it makes sense

Questions:

- 1) The panel generally agreed that long-term relationships are required for success in an EA environment. What are the top three things that you would include as part of this relationship and how would you implement these relationships contractually?
- 2) In addition to the top three things you would include in these long-term relationships, how would you decide whom to establish a long-term relationship with? How would ensure compliance with CICA? What are your selection criteria/thresholds? Who would approve the selection/arrangement?
- 3) Three participants submitted Long-Term Pricing Arrangements (LTPAs) be included in an EA strategy. What specific pricing elements (labor, material, etc.) would you include in these arrangements and why? Which ones would you not include and why? How would you negotiate such an arrangement? Who would be responsible for maintaining the arrangement?
- 4) Flexibility was submitted as a requirement for successful implementation of EA. If unconstrained by any other requirements and starting with a clean sheet of paper, can you think of a totally new contract arrangement that will facilitate flexibility? What are the advantages/disadvantages of your arrangement?
- 5) One participant suggested obtaining a class J&A for all production, sustainment, and development of a system for a period of years. Would this work for your program? Why or why not? What are the advantages and disadvantages of a class J&A? When

would you pursue this course of action and who would initiate it? How would the 50/50 law for sustainment be addressed?

- 6) We can trace EA back at least to 1993, and there have been comments that EA is just new packaging for an old idea. Do you agree? If so, how will you accommodate incremental development in your contracts? If not, what new ways will you use to contractually implement the EA emphasis?

Appendix F. Delphi Round 2(a). AAC Question Set

What contracting/business arrangements do you think worked (or will work) in supporting an evolutionary acquisition (EA) strategy? Provide an example if possible.

Four out of five respondents stated that stable, long-term, relationships with the supplier is a key to success in an EA environment. Early and continued involvement by current and potential suppliers was submitted by three members as a key to success.

There were several suggestions of what should be included as part of these relationships:

- 1) Three respondents submitted using Long-Term Pricing Arrangements (LTPAs) as part of an EA acquisition. These LTPAs are bilateral agreements between the Government and a prime contractor in which an obligation is made from the Government to exclusively buy a supply or a service from the prime contractor in return for an obligation to meet long-term price, quality/performance, and schedule commitments. They also suggested establishing goals of average procurement prices for each EA Phase in the LTPAs that are also contingent upon meeting schedule. These agreements are enforced through a contract clause that is structured with positive incentives to reward the contractor for meeting his commitments and remedies in the form of negative incentives if the contractor does not meet his commitments. Two members noted that these arrangements must be flexible to accommodate configuration and quantity changes.
- 2) Two responses remarked that the Government must allow industry to define the subset of requirements that they optimally can field in a given time/price and getting the warfighter's buy-in of the industry's proposed implementation phases.

3) Another respondent noted similarly that the relationship must allow industry to capitalize on their strengths so that each competitor/offeror does not have to meet identical segments of requirements but uses Cost/Schedule as Independent Variables (CAIVs) to determine what requirements they can implement during the prospective EA point/phase.

4) One respondent suggested using a Total System Performance Requirement (TSPR) Philosophy. This philosophy encompasses a two-part arrangement. The contractor agrees to perform the tasks that he deemed necessary and sufficient to develop, deliver, warrant, and support affordable combat capable and readily available weapons systems; the government agrees to define and communicate performance requirements, provide the requisite resources, support a long-term pricing strategy, and enable contractor activities.

Key attributes of TSPR that were submitted are:

- a) Contractor control and verification of the product based upon a system performance specification developed by the Government
- b) A system performance specification that maps directly back to the ORD
- c) Sitting down and identifying all of the tasks involved with the system and then deciding what makes sense for the contractor to do and what would remain a government function
- d) Contractor responsible and accountable with the Government remaining as the Enabler and maintaining overall authority/responsibility
- e) Contractor controlling Configuration Management and quality
- f) Freely sharing data between the contractor and the government, electronically where possible

5) One respondent defined the relationship as one that would reward industry for their ability to demonstrate greater creative flexibility while benefiting both parties (Government and Industry) over a sustained period of time. This relationship must acknowledge the ever-changing requirements/technology/sustainment over a specified period or life of a system. This relationship has the development and production teams work together as one unit to plan and implement new capabilities and technological advances.

Besides long-term relationships other business arrangement suggestions were also submitted. The suggestions include:

- 1) Two respondents suggested using FAR Part 12 rules to quickly inject rapidly evolving technology into the field.
- 2) One participant submitted leveraging off of competition to establish and promote a long-term relationship while ensuring that industry receives healthy/fair returns in profitability. This involves carrying our competitive efforts further through the acquisition cycle to promote more accountability/competition to meeting schedule and price commitments. The submitted benefit is competition increases the need for industry to meet their commitments to gain the benefits of a long-term arrangement.
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- 5) One participant suggested obtaining a class J&A for all production, sustainment, and development of a system for a period of years. Would this work for your program? Why or why not? What are the advantages and disadvantages of a class J&A? When would you pursue this course of action and who would initiate it? How would the 50/50 law for sustainment be addressed?
- 6) We can trace EA back at least to 1993, and there have been comments that EA is just new packaging for an old idea. Do you agree? If so, how will you accommodate incremental development in your contracts? If not, what new ways will you use to contractually implement the EA emphasis?

What contracting/business arrangements do you think worked (or will work) in supporting an evolutionary acquisition (EA) strategy? Provide an example if possible.

Four of six panel members replied that definition of the evolutionary increments is important. The best way to set up the contracting arrangement depended largely on how the increments were defined. It is difficult when you have a general idea of what you are contracting for but only specific information about a small part.

A Cost-Plus-Award Fee contract with a Base Fee and Teaming Fee broken out by Fiscal Year (FY and obligated at the beginning of each FY). The Teaming Fee is subject to semi-annual SAE/CEO reviews that provide feedback to the contractors relative to teaming effectiveness. This is accomplished prior to the release of the teaming dollars for the FY. The Teaming Fee is tied to the Milestone B decision. Specific wording includes: "In the event the FDO distributes teaming award fee prior to Milestone B and the subsequent decision at Milestone B is "Teaming Relationship Ineffective", the Government and the Contractor agree that the teaming award fee distributed prior to the decision shall be returned by the Contractor to the Government with interest."

Single Process Initiatives - Development of common items for various Government and Commercial services, programs, etc. spreads development costs thereby lowering overall cost of the program.

Joint Program Offices - spread the cost of programs among the services thereby reducing costs to each service while minimizing overhead.

A primarily Cost-Plus-Award Fee (CPAF) contract that allows for issuance of Technical Task Directives (TTD). TTDs provide for flexibility and quick contract modification when requirements change or subsequent increments of capability need to be placed on contract.

Forward Pricing Rate Agreements (FPRA) in place that define labor categories and their associated rates. As a result, proposals primarily involve negotiation of labor mix and hours and, using a one-pass process, are usually settled and placed on contract quickly once requirements are known and funding provided.

Two members responded that flexibility in the arrangement was a key to success. One suggested using a multiple priced option for incremental delivery might work well. Another proposed incorporating the entire requirements list into the contract vehicle, defining price, delivery dates, technical requirements, etc. for the known part and adding language that would permit definition of the other items in the future.

One respondent explained that they have used a Fixed Price Labor Hour (FPLH) contract to accommodate post development spirals where cost contracts were impossible. Performance milestones became critical to ensure a usable deliverable since this arrangement may not have a firm deliverable like a Firm-Fixed-Price arrangement might have.

What constraints (statutory, regulatory, business practice, financial etc.) exist in implementing EA and how can we (or have you) overcome them?

Three of six panel members mentioned that finance issues, to include color of money, availability, and type of money were constraints. One member suggested that the budget actually dictates the requirement. One respondent observed that reprogramming requests seem to be processed more quickly lately.

Selling a broadened outlook on the contract types and writing the vehicles in such a way that you were able to realize the deliverable was a tougher sell through the Government than through the contractor, who actually flourished under spiral enhanced contract vehicle.

Defining an end item for certain increments was mentioned as possibly causing some resistance.

Two respondents observed that the Competition in Contracting Act is an issue that must be addressed at program commencement when writing the SAMP/Acq. Plan/ or J&A in order to accommodate EA programs.

The USAF ORD process was identified as a constraint. The respondent stated that it was cumbersome and required too many layers of approval.

Finally, lack of experience and knowledge of our reviewers and team members. Existing regulations don't cover EA specifics, which causes roadblocks in the review process due to interpretation issues. Reviewers tend to look at new business arrangements with old regulations. The respondent observed that our staff tends to have

an inability to grasp something new and see how EA would actually realize a deliverable.

It has been their experience that allowing the contractor to work with fewer constraints actually produced a better product and working relationship.

Questions:

1. The definition of increments or spirals was raised as a concern in the EA arrangement. What processes/approach do you take to define each increment? Who is involved in these processes? How do you define future increments for unknown capabilities? At what point are these future increments definitions refined further?
2. How do/would you incorporate all increments in a contractual document? How would this appear in the contract document (CLIN, clause, attachment, etc.)?
3. One respondent presented the use of a unique award fee plan that included a Teaming Fee. Would this arrangement work for your acquisition? Why or why not? How would you define the evaluation criteria for such an arrangement? Who would determine, evaluate, and approve these criteria?
4. If unconstrained by any other requirements and starting with a clean sheet of paper, can you think of a totally new contract arrangement that will facilitate flexibility? What are the advantages/disadvantages of your arrangement?
5. Two respondents observed that CICA was a constraint in an EA arrangement. Do you agree or disagree with this statement? Why? How do/would you overcome the CICA requirements? Have you been successful in doing so?

6. We can trace EA back at least to 1993, and there have been comments that EA is just new packaging for an old idea. Do you agree? If so, how will you accommodate incremental development in your contracts? If not, what new ways will you use to contractually implement the EA emphasis?

Appendix H: Synopsis of Responses for Delphi Round 2(a)—AAC Specific Questions

Table 7. AAC Responses to Round 2(a)/ Question 1

The panel generally agreed that long-term relationships are required for success in an EA environment. What are the top three things that you would include as part of this relationship? 5 of 5 panelists responding

The top three actions/things needed for a successful long-term relationship is: 1)

Incentives to Industry for keeping the agreement that addresses the contractor's ability to maximize profitability (through controlled costs/ management of obsolesce) and reduced oversight or government regulations that drive costs and infrastructure; and penalties if contractor doesn't meet commitment based upon issues within contractor's control. 2)

Legislative or other coverage under Defense authorization Act that ensures stable funding. 3) Flexibility of format/structure to leverage off industry's willingness to offer prices for a range of quantities/prices/based upon timeframe need.

Long term requirement in which the contractor can invest/Measurable product quality/reliability/Fair and reasonable prices - set in advance to the extent practical.

First, lets not get Contractor/Government Teaming, Long Term Pricing Agreements and pricing models confused. The first is a business philosophy of jointly managing a win-win approach to a program much like that in a commercial arrangement. One of the tools used is to enter into long term pricing agreements, which may include prices, which may or may not have a pricing model associated with them. For example, AMRAAM implemented a Vision 2000 teaming approach, currently with a long term agreement for both production and sustainment through 2007 expressed in a contract that includes a) a missile pricing model, b) a repair pricing model, c) a telemetry unit model, and firm

prices for various other items (spares, warranties, limited technical support, FMS Offset administration costs, etc). With this understanding, I believe the three most important things are 1. Teamwork and Trust achieved through 2. The sharing of a long-term vision and 3. A goals and strategies to get there.

Without these, an LTPA is an agreement that will struggle and face a great chance of becoming a bludgeon document instead of one that is flexible and meets the needs of the parties involved.

The number one thing in my mind is stable funding, but unfortunately the program office has little control over how Congress and the services parcel out the money. When funding is in doubt, the contractor is hesitant to enter into long-term relationships with suppliers, and without these relationships in place, there is no hope of a long-term relationship between the government and the prime. Very few prime contractors manufacture the bulk of the parts that go into a weapon system – most are assembly houses that are dependent upon parts supplies by subcontractors.

The second is a long-term pricing agreement. There are many aspects to an LTPA that have nothing to do with the actual price. These are the carrots and sticks to either reward the contractor for meeting the LTPA or punish the contractor for busting the LTPA. Among the carrots are TSPR, configuration management responsibility, self-governance, reduced oversight by DCM, price based acquisition, reduced data requirements. On the other side, the sticks can include increased government oversight, government configuration management, tech data package submittal, second source qualification, and submission of cost and pricing data.

The third thing would be to foster an environment of trust with the ultimate goal of establishing a seamless IPT with the contractor. By seamless, I mean that the lines are blurred between contractor and government. Government employees attend contractor internal meetings and for all intents and purposes, are used by the contractor as their own employees. There are neither secrets nor surprises. When a problem arises, the contractor is not adverse to picking up the phone and calling the government counterpart to discuss the problem because there is no fear of the problem being blown out of proportion.

Develop a partnering agreement between industry professional organizations and the Government IPT. Let the industry professional affiliations help drive the solution and to help locate and find associated sources of supply (similar to an Architect & Engineering effort) consider this advanced market research. Then, develop partnering agreements with the firms most likely to produce the required needed items.

How would you implement these relationships contractually?
5 of 5 panelists responding

Contractual implementation can be done through special contract provisions that outline the incentives and penalties, address the types of costs to be included in the prices, and timeframe and quantity that prices are based upon. The provision can address any and all aspects of the agreement needed to ensure that the parties understand what the business arrangement is, but a word of caution as to making the agreement so specific as to remove flexibility for future use given unknown or unforeseen needs.

Implemented by award term/dollar incentive arrangements/advance pricing agreements.

Most of these are done without a contract, and MUST be pushed from the top down. Contractually, I would implement these by making a performance based technical document (SOO or SOC) describing the philosophy and the requirement. Negotiations would be on a Review, Discuss, Concur basis, and I would express the long-term agreement in option language in a clause of the contract to be exercised as separate contractual vehicles when deemed necessary. I would institute a Total System Performance Responsibility (TSPR) approach, lay out all tasks and then determine those to be under the control of the contractor, then place them in a task destination document to be signed by both parties. The SOO/SOC and clause language would include the basic TSPR philosophy agreement.

Of these three things, the first is not a contractual matter. Although it is the most important, it is the one item that the program office has the least control over. The second item is incorporated into the contract through a special clause. The third item is a philosophy that must start from the top and move down to the lowest layers of the organization. It isn't something that can be dictated or measured for an award fee.

Contractually, 1st develop basic partnering pre-contract operating agreements between industry and the Government; 2nd, make decisions regarding who will do design & research & prototype vs. who will test the products, vs. who will own the rights, etc.; 3rd develop into IDIQ's (preferably FFP) with the best suppliers/manufacturers from recommended industry association groups; 4th, push Small Business participation down

to the major suppliers/manufacturers (strongly enforce and strengthen subcontracting plans if large business concern).

Table 8. AAC Responses to Round 2(a)/ Question 2

In addition to the top three things you would include in these long-term relationships, how would you decide whom to establish a long-term relationship with? 5 of 5 panelists responding

The competitive environment encourages industry to offer their most favorable prices, and generates more willingness on industry's part to accept reasonable risk. Additionally, the long-term agreement, protects the government from an initial "buy-in" threat, since there is less opportunity for industry to "get well" after the initial procurement is over and a sole source environment has been assured. However, if the government lacks the time, knowledge and skill, to determine upfront the needs of the user for the life of the long-term agreement, then the buy-in threat is greater, since industry will assume that changes in requirements will open up the long-term agreement.

Past performance and reasonableness of proposal to determine if the supplier is reliable.

It would depend in large part upon where you were in your process. If you were just starting out in your development and acquisition planning, market research is your key to understanding how wide your market is for the product or service you expect. You would likely perform a source selection based upon best value, and be very up front about your intentions to make the relationship long-term. This would be a strong "criteria" in your best value selection. If you were already in a dual source type arena, a similar approach could be employed.

In AMRAAM, we were in a competitive arena prior to end of '97 (with 2 ongoing suppliers) until Raytheon bought Hughes. A Justification and Approval 10 USC 2304(c)(1) has been our CICA exception ever since. With regards to sustainment, we achieved a single source of repair approval (also called a SORAP decision) from the Defense Depot Management Council, which allowed Raytheon to go sole source. When entering into a teaming arrangement, you need to consider what will give the contractor the most synergy, reduce infrastructure costs, provide the maximum ability for the contractor to be responsible for the product, etc., then weigh that against vendor breakout at lower levels of sustainment of the product or components and decide whether to fold that into the exception. AMRAAM currently has competition of some sustainment spares and component parts.

As much care should be taken to choose a contractor, as a person uses when choosing a mate because the program is choosing its partner 'for life' in a long-term relationship. Past performance should, in most cases, bear the most weight as a factor. How a contractor will perform on the new program is best illustrated by how he/she performed in the recent and relevant past. If the contractor had a good system engineering process, for example, it is unlikely that the system engineering process will change for the new program. But, not all areas of past performance are relevant or worthy of review.

Based on professionally recognized industry associations (recommendations as experts in the field), past performance under Gov't and commercial past efforts, capabilities, preaward surveys, financial data, FAR Part 9 criteria, etc.

How would ensure compliance with CICA? 5 of 5 panelists responding

The most effective method for obtaining a long-term agreement is through competition.

Compete initially with award term options.

A competitive source selection would satisfy the CICA requirement.

As to CICA, as long as the source selection is full and open competition, there is compliance with CICA.

CICA is the tough one. A competitive process may be made prior to a partnering agreement being established and/or source selection procedures similar to Architect & Engineering Selections, or other proven commercial practices, etc.

What are your selection criteria/thresholds? 5 of 5 panelists responding

If evolutionary acquisition approach is used, this means that there has to be a greater emphasis on validating the proposed phasing of requirements and ensuring user agreement that the proposed phased capability is acceptable over the long-term agreement and is not to be taken lightly.

I would only select suppliers who have been determined reliable through evaluating past performance.

The selection criteria would be based upon the value you wanted to achieve. For example, performance would be a strong consideration, as well as management, if you wanted a company serious about a long-term relationship with a good reputation of contractually fulfilling promises. Of course, technical areas are inherent.

If this question pertains to a new program, the decision is made through a source selection whose criteria consist of those things important to the program. It makes sense

that the source selection only look at those areas that are important to the success of its program, such as systems engineering, schedule control, vendor control, or program management. The other factors and the weight given to them are, once again, dependent upon the program. If the schedule for fielding a weapon system is important – and in an EA environment it should be – then risk may be the next most important factor.

Certainly mission capability (performance) and cost/price (or affordability) must also be considered, since if it doesn't work, or if it is too expensive, it doesn't matter how fast a weapon system can be fielded.

Selection would be based on the best overall integrated assessment to the Government, "Best Value" considering all things including recommendations from professional organizations, price (broken-down into who provides design and testing, best options, etc.), past performance, capabilities, partnerships with small business concerns, etc...

Thresholds should be \$10M or less Contracting Officer (CO) approval, \$25M or less Chief of the Contracting Office (COCO), \$50M or less Buying Office Contracting Official (BOCO), Greater than \$50M the Designated Acquisition Commander (DAC). Current SAT thresholds should move to \$200K; Synopsis thresholds should move to \$100K; Review thresholds \$500K or less, the CO (and limited advisors); above \$500K, policy review and clearance procedures would apply. Partnering agreements same thresholds based on aggregate procurement amounts.

Who would approve the selection/arrangement? 5 of 5 panelists responding

The approval authority for this should be the Source Selection Authority or MDA and should address the impacts of changing requirements.

The approval authority should be the Source Selection Authority.

Selection would be the Source Selection Authority, in accordance with prescribed regulatory levels.

The source selection authority makes the final decision.

Thresholds should be \$10M or less CO approval, \$25M or less COCO, \$50M or less BOCO, Greater than \$50M the DAC. Current SAT thresholds should move to \$200K; Synopsis thresholds should move to \$100K; Review thresholds \$500K or less, the CO (and limited advisors); above \$500K, policy review and clearance procedures would apply. Partnering agreements same thresholds based on aggregate procurement amounts.

Table 9. AAC Responses to Round 2(a)/ Question 3

Three participants submitted Long-Term Pricing Arrangements (LTPAs) be included in an EA strategy. What specific pricing elements (labor, material, etc.) would you include in these arrangements and why? 5 of 5 panelists responding

The costs proposed and evaluated under the LTPA should be all costs necessary to produce, deliver, and field the end item. This includes all production tooling, capitalization, non-recurring, and recurring cost inherent in the end item design. Only then can you ensure that in a competitive environment you are comparing "apples to apples" and that your incentive structure properly rewards the contractor for the assumption of controlling their costs.

What I intended by stating that "all cost necessary to produce the end item" is included in the LTPA, is that all costs known and reasonably anticipated - the same that a contractor would have to forecast and include in a Firm Fixed Price Option for out year

prices. Here is some language out of LTPA provision that addresses the costs that are to be included:

The procurement price is a composite of recurring and non-recurring costs that includes all fully burdened contractor production costs incurred in the manufacture of a usable end item (Flyaway); the equipment and materials required to support it (Weapon System); and initial spares. It includes the contractor's cost associated with the prime mission equipment (hardware and software), systems engineering, program management, containers, first destination transportation costs, special tooling and test equipment (which shall not be amortized), peculiar support equipment, acceptance tests, warranty, contractor caused engineering change proposals and award fee/profit.

Cost drivers - most impact.

To avoid confusion between terms described in my response to question 1, I will be speaking within the confines of a long term pricing agreement. First of all lets look at the pricing model. The model should be as flexible as possible to accommodate any configuration and quantity (within reason). You would need to agree on those elements that are finite, and not those that are subject to swing or change a great deal over time. For example, you would not agree on a fixed degree of inflation to apply, you'd instead agree on an inflation index to use and have that made part of the model. That way, the bottom line price could change, yet still be considered a negotiated FFP because the element of change was defined.

LTPAs should include all the recurring/nonrecurring cost/price known at the time of contract award, and should only be renegotiated when a significant requirements change drives an increase in price. In an EA environment, an LTPA would probably only be

valid until the next spiral is incorporated into the technical baseline because increased performance generally translates into increased cost. However, in this case, you would probably have an argument in favor of only getting cost/pricing data on that portion of the weapon system that changed since, once again, all the rest was obtained under adequate price competition.

Depends on the procurement and the stage it is in. Time and Materials (labor & material costs), Overhead rates and G & A costs are okay for limited efforts, but you should have a long-term roadmap to go FFP no later than production execution.

Which ones would you not include and why? 4 of 5 panelists responding

Do not include strategic materials or other over which there is little control.

You would not include those elements that are subject to swing or change a great deal over time. For example, you would not agree on a fixed degree of inflation to apply, you'd instead agree on an inflation index to use and have that made part of the model. That way, the bottom line price could change, yet still be considered a negotiated FFP because the element of change was defined.

If an LTPA is considered as part of the source selection, and there is adequate price competition, I would offer that you probably wouldn't have insight into the discreet cost elements since you are prohibited from requiring cost and pricing data.

Cost of Money, Extended Overhead rates, basic costs with doing business over and above normal overhead rates; this is because if the firm is already in business and a recognized professional industry, these costs have already been accepted. The doors will

likely remain open regardless of winning this contract effort. The company should look for future security/business as a major profit incentive.

How would you negotiate such an arrangement? 4 of 5 panelists responding

Emphasize controllable costs/arrangement proposed by offerors in competitive proposals if possible.

Developing a good model has to do with openness with your contractor. You MUST be able to be honest in your cares and have open books to get to a bottom line number that is acceptable to both sides.

The arrangement is captured in a special clause of the contract that details the terms of the LTPA, and the carrots for meeting the LTPA, and the sticks for not meeting it.

Negotiate a pre-contract teaming arrangement as described before, who pays design cost, who assumes testing costs, who gets patent rights, who gets data/design rights, etc. and put a value to those intangibles as incentives to industry. Take the best negotiated overall "deal" for the Government including considering cost, performance, and delivery and sustainment issues.

Who would be responsible for maintaining the arrangement?

4 of 5 panelists responding

Responsibility for the arrangement is both the Government's and Industry. The government must adhere to buying according to the parameters of the agreement and industry must adhere to providing a quality product at the price and schedule they agreed to.

The Government and the Contractor are equally responsible for maintaining agreement.

The Government Financial Manager and Contractor equivalent are key players, along with your PCO and contractor equivalent. Once the model is in place, it should be available by both parties for use. In AMRAAM, the government financial manager is the responsible point of contact. However, the model is available on an electronic database for FM and PK personnel (Contractor and Government).

The entire IPT Team collectively, the Contracting Officer as the lead with industry.

Table 10. AAC Responses to Round 2(a)/ Question 4

Flexibility was submitted as a requirement for successful implementation of EA. If unconstrained by any other requirements and starting with a clean sheet of paper, can you think of a totally new contract arrangement that will facilitate flexibility?
5 of 5 panelists responding

The key to being successful is to intensely leverage industry's strength. Therefore to maximum extent possible, they should drive the quantity ranges based upon the most economically favorable price breaks, they should identify the configuration/performance the items will have in each production lot/timeframe based upon their technology risk assessment, they should provide a full product warranty that ensures the item will perform in the manner/environment it is intended for, and they should be rewarded based upon the User's assessment of performance and satisfaction with the product once it is delivered.

No - Existing contract arrangements will suffice if freed of constraints.

For a major acquisition, I think that one contract may not be optimal. The key is a coordinated solid approach that considers life cycle costs, all "parts" of the program,

known unknowns, and most importantly, the results. The focus should never be on the contract; it is merely a vehicle to facilitate and to document communication. Instead, one should look at the situation, understand what needs to be done, and then decide how to articulate it into a document (contract). For example, AMRAAM has implemented a long-term partnership, starting with Vision 2000, that incorporated a TSPR philosophy and a team approach to the product (AMRAAM). The outcome in terms of contract was 1) a FFP production and sustainment contract, with pricing negotiated through 2007 that included 3 pricing models as well as other items negotiated without use of pricing models, 2) a CPAF development contract with the award fee portion as a CAIV effort (the contractor commits to a price and the CAIV approach keeps pushing to goal above threshold), 3) a minimal time and materials contract for quick look, fast turnaround studies/analyses, etc., and 4) a small number of component parts competed.

This kind of depends on what stage the program is in. Although not a ‘totally new contract arrangement,’ the most flexible vehicle I know of is a Section 845 Other Transaction, assuming you are entering Component Advanced Development (CAD) or System Development and Demonstration.

Yes, the pre-contract partnering agreements with industry based upon professional association recommendations. The Government can tap into industry professionals for solutions to long-term requirements. Put the industry into the equation early in the process, get the brightest minds working on the solution and contract with the forefront industry professionals.

What are the advantages/disadvantages of your arrangement?

4 of 5 panelists responding

The disadvantage to leveraging industry's strength is that it creates a more difficult assessment of what is best value to the government since there may be a broad range of approaches proposed. It also means the government needs to be willing to "rethink" how we contract for these items and approach it from the standpoint that we must allow industry to drive the train with respect to technology/performance, and not dictate what we must have/ and when we must have it. This is going to create a strong resistance to accept industry's input as the basis for when/and how we could have a product.

A coordinated solid approach that considers life cycle costs, all "parts" of the program, known unknowns, and most importantly, the results has the advantages of one-stop shopping (except for #4 above) low infrastructure, and high synergy. The contracts are well defined in purpose and thus easier to administer than one super contract with mixed types. There are several acquisition excellence initiatives built into the contract to make them easy to follow and much easier to close out. The disadvantages might be in the discipline to keep them well understood and tasks/costs well identified/segregated.

When using an OT, both parties truly begin with a blank piece of paper. It is not a FAR contract, nor does it use FAR clauses. Everything is negotiated – from data rights to both parties having the right to terminate the other. The contractor brings his/her own share of investment to the table, much like investing IR&D.

Pre-contract partnering agreements with industry based upon professional association recommendations probably means more contracts to larger firms, better solutions, quicker deliveries, faster total lead times, better products, etc. The disadvantages are less

Government oversight, less competition, fewer small business goals being met by the Government (push more stringent SBA requirements down to industry to foster SB goals) may cost a little more initially (long-term should save money).

Table 11. AAC Responses to Round 2(a)/ Question 5

One participant suggested obtaining a class J&A for all production, sustainment, and development of a system for a period of years. Would this work for your program? Why or why not? 5 of 5 panelists responding

A Class J&A would be needed to narrow the field of competitors down to two or more for the early development phase (and focus on full and open competition after restriction of sources).

A Class J&A would work for most major programs - if it can be written broadly enough.

Since I suggested this, it obviously works for my organization.

A class J&A certainly goes a long way to creating and maintaining a long term relationship, and yes, it will work for our program as well. Small Diameter Bomb is an evolutionary acquisition, and, although the warfighter has deferred any spirals until outside the FYDP, we do intend to go sole source for the life of the program after this two-year competition is ended. I am pursuing a waiver for a J&A on the basis that we have a SAMP coordinated through SAF and signed by OSD that approves our acquisition strategy of limited competition after the initial rolling down select, and then sole source for the remainder of the program as long as Congress passes no specific law mandating competition for this phase, the contractor offers prices that the Government finds are fair and reasonable, the contractor produces a quality product that meets the system

specification and fulfills his warranty obligations, the contractor continues to perform in accordance with the terms and conditions of his contract, funds are available, and the chosen contractor has not been suspended or debarred.

Yes, a Class J&A would work for my program. It would allow management buy-in earlier in the process.

What are the advantages and disadvantages of a class J&A?

5 of 5 panelists responding

Narrowing the competitive field down enables industry to mature the design/costs of the product before having to finalize the prices offered for the LTPA and yet maintain the competitive environment for obtaining those long-term prices.

A Class J&A eliminates delays.

Since the class J&A speaks in broad program terms, changes as to items within the broad terms (categories of supplies/services) can take place, and dollars within them, so long as the changes meet the overall definition, description, and total dollar amount approved.

A class J&A certainly goes a long way to creating and maintaining a long-term relationship.

Advantages include a simplified process and quicker response to the warfighter needs. Disadvantages include limited competition and reduced oversight.

When would you pursue this course of action and who would initiate it?

5 of 5 panelists responding

The Acquisition Strategy may take the approach to gradually narrow your competitive field to the most highly competitive and carry these sources through an early prototype/development stage.

The Government should initiate if the class J&A is written broadly enough to accommodate your program.

You would pursue a class J&A when you have a large number of like requirements or related requirements that will be purchased from a single supplier. The alternative would be to pursue an individual J&A for each supply or service (separately) and having to essentially re-create the same J&A over and over and keep having to get coordination and approvals to get to the same result. A class J&A secures your authority to go sole source/limited sources for everything so that this (approval) concern is removed; program planning/implementation can continue unabated. I suppose the only problem would be that combining items might take you to a higher visibility (approval) threshold; however, this should not be a valid concern to a good acquisition approach.

A J&A is generally a collaborative effort between program management and contracting, and should be initiated as soon as the acquisition strategy includes limited or no competition.

Pursue on all long-term arrangements (over one year in length) during Acquisition Planning and partnering with industry. The IPT Team and Program Manager specifically would be responsible for the initiation.

How would the 50/50 law for sustainment be addressed? 4 of 5 panelists responding

If the warranty of the product is included in the price, then sustainment is minimized and no 50/50 issue arises.

Still stuck with the 50/50 law so far as I know - just have to live with it.

With regard to the 50/50 rule, the latest info I have says this is currently under discussion in Congress. However, AMRAAM operates under the SORAP decision. I would suppose that a waiver or exemption would have to be reached for those without such a decision document. The only other alternative would be to discuss with the contractor about a plan whereby you could reach joint agreement on those items that would be most effectively incorporated into contractor repair.

Address the 50/50 law through industry early involvement to possible requirement solutions.

Table 12. AAC Responses to Round 2(a)/ Question 6

We can trace EA back at least to 1993, and there have been comments that EA is just new packaging for an old idea. Do you agree? 5 of 5 panelists responding

I believe that EA as defined today is not the same as the approaches in the past with one distinct difference. It requires upfront recognition/agreement and planning of future requirement changes that occur over the life of a system.

Yes.

EA does have its roots in many previous ideas (block changes, Preplanned product improvements {P3I}, phased technical approaches, etc.), but it is not quite accurate to say that all is old. The determinant is how we build on the old, and to what degree the ideas are promoted and fostered within the Defense Department.

Although other acquisition reform initiatives appear to have some of the same characteristics as evolutionary acquisition, I don't believe they are the same thing.

Yes.

If so, how will you accommodate incremental development in your contracts?
2 of 5 panelists responding

Plan for phases or include new technology when it becomes available by adding scope.

With the current environment in a state of high flux (new AFFARS, etc.) unsure. Try to use smart sound business practices and keep common sense in the forefront.

If not, what new ways will you use to contractually implement the EA emphasis?
3 of 5 panelists responding

In formally recognizing the need to plan a structure/business arrangement that is based upon a known set of requirements, the government can more effectively budget, manage and field a system that meets the users' expectations. It also affords the government the advantage of obtaining a stronger commitment to quality, schedule, and price at the beginning of a procurement that may be maintained instead of addressing needs on an as-needed basis, with little leverage to encourage industry to work with the government to obtain the most mutually beneficial arrangement.

In my contracts we are using our P3I development contracts to introduce new configurations or new technologies into our FFP production contract. Through use of pricing models and a CAIV approach in the CPAF development contracts, the agreement is already well established and can easily transition into the production FFP contract. This

year we used the results of our P3I model/contract to fold the C7 missile configuration into the production B and C5 model and achieve a price using price based analysis (without cost or pricing data). The total value of the contract was 2.3 billion dollars - this would have been unthinkable without use of this EA approach.

If this were an accepted way of doing business (whatever it was/is called), then we wouldn't have so much trouble with the user regarding the concept of delivering something less than the 100% solution to the field.

Table 13. ASC Responses to Round 2(b)/ Question 1

What potential impacts will the AFFARS (June 2002) rewrite have on your program? (AF FARSite link: <http://farsite.hill.af.mil/vffar1.htm>)
6 of 6 panelists responding

As a Procurement Analyst, I support numerous SPOs as well as Base Operational Support and National Air Intelligence Center (NAIC). The AFFARS rewrite is having a tremendous impact on the way we do business. The most significant change is that the PEO/DAC is now Head of the Contracting Activity. What this means is that each PEO and DAC can establish whatever thresholds and procedures they choose for contract review, clearance, etc. For years, industry has been lobbying for consistency in our processes, including our Requests for Proposals and contracts. The AFFARS and AFMC rewrite no longer specifies processes (each program establishes its own processes and a laundry list of literally hundreds of RFP and contract clauses have been removed). The net effect will be each program will establish a process for that acquisition and write unique clauses as needed. This will be a challenge for contractors, procurement staff, and lawyers.

It will allow the single manager to meet already tight schedules in execution of his program. In today's environment of acquisition streamlining this is a very important factor. However, one can only hope that in making his/her decision he/she will include in that decision input from the business side of the team (i.e. JAG, CO) as well as the lead functionals of his/her team. Working under a PEO on our program we have already

experienced the level of delegation on such items as ASP, SAMP and UCA's. The J&A delegation did not change with the AFFARS.

Biggest single change: more empowerment, less oversight for PEO/DAC programs. Major impact of AFFAR rewrite is PEOs/DAQs are now designated HCAs (Head of the Contracting Activity) for PEO/DAC programs.

Impact will be minimal as far as time saved. The changes are welcome but essentially just changed who has to be briefed or who approves the clearance, RFP etc. For example: A clearance in the past that had to go to SAF/AQ can now be done by the PEO. The work to put the briefing together and coordinating with the appropriate functional offices in the SPO is still there, the only change is that I have to brief one (1) less person/office --- in this example SAF/AQ. As far as cycle time reduction, it may save me a couple of days. If you want to get true significant cycle time reduction, start pounding on the requirements side of the acquisition cycle. We have beat to death the 6-month timeframe from RFP release to contract award. No one seems to be looking at the 3+-year average that it takes to get an ORD finalized.

None.

Table 14. ASC Responses to Round 2(b)/ Question 2

Under what conditions/circumstances would a single award ID/IQ contract arrangement benefit an EA strategy? 5 of 6 panelists responding

There is a flurry of ID/IQ contracts at ASC. They are being used for everything from buying aircraft to ICS, CLS, maintenance, modifications, development, etc. Many of

them are 10 to 15 yrs in length. They could be used to support evolutionary acquisition and are in some cases.

It would support the spiral development of the system the System Program Director (SPD) is executing. If you are in the latest stages of a new development under a single ID/IQ, the SPD has the capability to more efficiently manage the development while transitioning to Full Rate Production (FRP). On the other hand, if during FRP the program requires new or more developing of the design of the system, the SPD has the capability of placing that change on the existing contract. That helps his/her manage the workload for the team, benefits the close out procedures with each D.O. that in the long run potentially saves costs to the program. The costs associated with each D.O. would be obligated at the time of the award of the D.O. This allows the SPD only to award the D.O. if funds are available.

A single award ID/IQ contract is best where only ONE contractor can reasonably perform the work because of uniqueness or highly specialized work or the tasks are so intricately related.

For obvious reasons, a single award would be most cost efficient in terms of eliminating multiple decision reviews/briefings, multiple documents and reduced travel/TDY expenses.

None. EMD and Production running concurrently. Single award wouldn't help.

How would you structure/price for future increments under this arrangement?
5 of 6 participants responding

Future increments are not being priced, however. Even though ID/IQ contracts typically

should have priced effort, the current movement is to reserve CLINs for future effort with either NTE prices or no price limit at all.

Each D.O. would be structured to fit the type of effort it is, i.e. development which would most likely be cost type contract and for production effort it would be fixed price of some sort.

Bottom Line: you want Total System Perform Responsibility (TSPR) - I call it one belly button to push. I wouldn't lock myself into one pricing structure. I would keep it flexible. You would want to have Cost and FFP clause, T&M, etc. You might be able to negotiate labor rates and leave the skill mix and number of hours open to be negotiated with each delivery/task order. I would preprice whatever made sense, BUT not lock myself in. The key here is to be able to change with the requirement.

You can't price future increments until you know the requirements for the future spiral(s). Our program is in this situation now --- we have just finished pricing and contractually incorporating Spiral 1. We have a top-level idea of what we want for Spiral 2 but haven't set the requirements and can't even begin to price this next spiral. A lot of what Spiral 2 turns out to be will depend on the Contractor's PERFORMANCE in Spiral 1. An ID/IQ contract doesn't really buy you anything unless the requirements are PRICED.

See our ASP briefing for phasing/pricing of future increments and spirals.

Table 15. ASC Responses to Round 2(b)/ Question 3

Under what conditions/circumstances would a multiple award ID/IQ contract arrangement benefit an EA strategy? 4 of 6 panelists responding

I am not familiar with multiple ID/IQ contract arrangements, therefore, I cannot comment on this one.

Multiple award contracts work best where individual tasks or increments of task can easily be separated and then be incorporated into the master plan. Plug and play requirements. One contractor makes the table legs - one makes the tabletop, etc. Key issue here is who will be the integrator? Is it something the government wants to take on? These would typically be competed each time, so they have to be distinct and not so interrelated as to need one point of contact (basically the reverse of the situation in number 2 above). Major benefit: enjoy competition and larger business base. Major challenge: who will integrate and how do you avoid finger pointing when something goes wrong.

It is highly unlikely you would continue to fund multiple sources for an EA/spiral development activity --- You can't afford it. Normally, a source selection is conducted and a single source is selected. Also, an ID/IQ contract doesn't really buy you anything unless the requirements are PRICED. Knowledge of the requirements and the risks in meeting those requirements drives the business arrangement --- not vice versa.

Incorporating EA does NOT require any new/unique business arrangements --- just slight "adjustments" to existing contract strategies.

None. Sole source contracts.

How would you structure/price for future increments under this arrangement?

3 of 6 panelists responding

Future increments should be well planned, clearly defined, and priced if possible.

Same pricing strategy would apply as above, with the exception of competitive actions where you will look at price, not costs.

Multiple award documents phased over the traditional acquisition milestones compliment ID/IQ contracting by delivery orders. Delivery orders were intended to contract for shorter periods of time and succinctly definable requirements. Prolonged periods of performance defeats the purpose of D.O.s. (i.e. DFAS will lose scope of the multitude of ACRNs that will accumulate during the life cycle of a prolonged periods of performance). As with the B-2 Radar Pathfinder Program, we intend to phase the program by the following delivery orders:

CAD Phase 1	F33657-99-D-0012, D.O. 0017	CPAF
CAD Phase 2	Mod to DO 0017	CPAF
SDD	Separate D.O. (#TBD)	CPAF
Production Kits	Separate D.O.	FFP
Installs	Separate D.O.	FFP

Table 16. ASC Responses to Round 2(b)/ Question 4

If unconstrained by any other requirements and starting with a clean sheet of paper, can you think of a totally new contract arrangement for an EA environment? 6 of 6 panelists responding

I don't believe there is any "silver bullet" or new contract arrangement for EA. EA has been around in various formats for a long time. Virtually every major program has gone through the process-though many not successfully. The problem is in the upfront planning and management of the acquisition. The CO has an endless variety of tools and techniques to support an effective and executable plan. But that's the key - the entire effort must be planned and it must be executable.

I would like to see more of the Other Transactions philosophy used within AFRL or at least adapted to the to fit the System side of the procurement.

It would have to be something that contractors would buy into. It cannot be so risky that no one contractor bites on the arrangement. This would be something that I might ask industry. Are you asking anyone from industry these EA questions? I would be interested in their perspective. Bottom Line: use multiple contract arrangements in your basic contract: Far Part 15 and commercial, cost and firm-fixed price. Then you could pick the specific arrangement you need for each spiral. Key here is to keep it flexible with lots of choices - yet not so complicated that it becomes a nightmare to administer. Bottom Line: broad scope, multiple contract types, LONG period of performance (10 -15 years), so something can actually get close to completed before you have to start over.

See previous comment. EA is just a re-packaging of P3I from the old days. We didn't use any "new and unique" business arrangements for P3I --- we don't need to re-invent the wheel for EA either.

The B-2 SPO has a streamlined process call "Diego". It exists on the close teaming of the program office and the contractor.

Current contract types available should work in an unconstrained environment.

What are the advantages and disadvantages of your arrangement? 5 of 6 panelists responding

Too often, significant issues are "kicked down the road" for someone else to deal with.

Advantages of the Other Transactions philosophy would include the openness among the team members, government, prime and subcontractors. Even though we use IPT's

within the Program Offices, we don't use them to the extent we could if we were able to form consortiums within the government and the contractor. I know the FAR dictates "privity of contract" between the prime and subcontractors; however, we usually end up discussing things with the subcontractor. If we were to form consortiums all parties would be able to voice their concern or ideas in front of everyone working the project. From my experience when we discuss issues with the Prime our concerns do not always get passed to the Subs the way they were intended causing confusion on the government side as well as on the contractor side. This has been a big issue on many programs I have worked over the years. With a consortium every one on the team makes his/her contributions and the ideas or fixes that come out of that discussion knows whether it will be implemented, revised or cancelled. The OT agreement is written by all members involved and signed by all members indicating they will honor that agreement. Although this type of agreement does not fall under the Federal Acquisition Regulations there are some areas that the FAR is still used as a guideline. (i.e. technical data, patent rights etc).

I think of a menu, you want enough choices to keep your customers coming back, but not so many you can't cook/manage them decently. You can't make it a management nightmare for the government OR the contractors. Simple with choices.

Without infringing upon statutory rules (laws) such as appropriation law and new start authorization, the current process is about as streamlined as it can be.

The spiral acquisition and complexities that accompany this type of acquisition are constraints in themselves. It's the constraints that drive the acquisition community to seek new arrangements.

Table 17. ASC Responses to Round 2(b)/ Question 5

We can trace EA back at least to 1993, and there have been comments that EA is just new packaging for an old idea. Do you agree? 6 of 6 panelists responding

Incremental development has always been available and some have used it effectively. Most of the time, however, the development has been incremental by default, due to insufficient funding, poor planning, immature technology, and many other reasons. When the program manager is forced into EA by default, it works very poorly and no one is a winner.

No, I do not agree. I think the acquisition process has seen many new changes. I have been in contracting for 20 years and over those twenty years I have seen, some post 1993 and some pre-1993 changes that would be classified as old ideas in new packages. But I think there have been some real strides forward in implementing changes that are a cultural change. For example, I think we are using an existing contract type, ID/IQ to further enhance the procurement side of giving the SM the tools he/she needs to implement EA. People may say it's an old idea and that may be the case in some programs or functionals, however, there is nothing wrong with creating new ideas to old tools.

Yes, I agree.

Personally, I think EA is just new packaging of an old idea. I do like the idea of giving the warfighter SOMETHING (60%) solution and then following it up with incremental improvements. Kind of like - giving them a car to drive first, then increasing the speed, and then the range, number of occupants, adding on automatic, AC, radio, CD, sunroof.

You get the idea. In the past we have waited so long for the car to be developed that it is old technology by the time we actually "get behind the wheel".

I was on the leading edge of streamlining during my years with Big Safari (now in the ASC/RA SPO) and C-17 during the production buyout period in the early 90's. We've gotten a lot smarter by teaming with the contractor as a vested partner rather than the attitude of "them & us".

No, I do not agree.

If so, how will you accommodate incremental development in your contracts?

3 of 6 panelists responding

Bottom Line: you want Total System Performance Responsibility (TSPR) - I call it one belly button to push. I wouldn't lock myself into one pricing structure. I would keep it flexible. You would want to have Cost and FFP clause, T&M, etc. You might be able to negotiate labor rates and leave the skill mix and number of hours open to be negotiated with each delivery/task order. I would preprice whatever made sense, BUT not lock myself in. The key here is to be able to change with the requirement.

EA is just a re-packaging of P3I from the old days. We didn't use any "new and unique" business arrangements for P3I --- we don't need to re-invent the wheel for EA either.

I would accommodate incremental development by first having INCREMENTAL tasks that are clearly defined and severable that can be implemented either in serial or parallel tasks. I would also want SOME assurance that funding profile was available for future tasks. Bottom Line: we have to have some idea of what we want to incrementally development. We can't just say we want something and we want it fast.

If not, what new ways will you use to contractually implement the EA emphasis?
4 of 6 panelists responding

The "new" part of EA is that we are finally acknowledging we can't buy the system we really want to do what we want in the time we want.

We are being given the opportunity to lean forward and apply new ideas to the existing tools that are out there. I believe any change is hard to implement and get people to grasp the changes to where they can think "out of the box" in implementing those changes.

I have no plan to contract any differently than the acquisition strategy set out in our plan as provided in question 2.

No year money and a predictable stream of funds would go a very long way in removing work arounds that make this type of contracting difficult. Freezing requirements at a point in time is another that would be a major improvement.

Table 18. ESC Responses to Round 2(c)/ Question 1

The definition of increments or spirals was raised as a concern in the EA arrangement. What processes/approach do you take to define each increment?

5 of 7 panelists responding

There is a Spiral Development Integrated Process Team (SDIPT) that meets regularly to discuss these issues.

Have seen the increments both defined by the Government up front or defined by the contractor based upon Government requirements. Might be a combo of the above, Government defining certain increments with contractor allowed to define others. Sometimes in a competitive action, a plan is required from the contractor. When Government defines increments reliance is placed upon requirements and requirements definition process as well as risk analysis and market research processes.

The approach is to clearly define the beginning and ending points, or more specifically, a well defined deliverable.

My initial thought on what a contract document would look like could be just a basic CLIN with the first increment and possibly priced options. I believe funding would be an issue - limits how much we can do and limits how many increments we get. What gets the minimum amount of capability out to the warfighter first and how many increments do we need to get to the desired level of performance.

The best way to describe this EA is a strategy to deliver capability in an incremental fashion. Spiral Development is a process to develop capability in an iterative, risk

reduction fashion. The first delivery out of EA is called "Initial capability", and each delivery after that is called an "Increment". Spiral development occurs within the development of either the initial capability or each subsequent increment.

Who is involved in these processes? *4 of 7 panelists responding*

Both the program office and users are represented on the SDIPT.

There is a combination of Government and Contractor involvement.

The using community usually dictates the need for the spiral, coupled with the program's funding profile (Is the spiral budgeted for?; In what fiscal year(s)?)

The normal acquisition process applies within either the initial capability or each increment i.e. the Integrated Product Team that develops the product (consisting of the SPO, ALC, and user).

How do you define future increments for unknown capabilities?

3 of 7 panelists responding

Future increments for unknown requirements are often provided with general boundaries.

You amend the Acquisition Plan and contract respectively as needs develop and are funded - unless you have some kind of crystal ball that can tell you what your unknown unknowns and future requirements are.

All capabilities are addressed in the Operational Requirements Document (ORD) and that is what you build your program around. As other requirements arise, then tradeoffs can be done through Cost As An Independent Variable (CAIV) to determine whether or

not to pursue that new requirement. A capabilities matrix is developed starting with the ORD requirements. The goal is to meet the Key Performance Parameters (KPPs), and then the requirements are further broken down into thresholds and objectives. For example, a KPP could be speed, and the objective could be 120 MPH, with a threshold of 100 MPH. The initial capability could deliver 80 MPH, and then the first increment could deliver 100 MPH, with the final increment delivering 120 MPH.

At what point are these future increments definitions refined further?

3 of 7 panelists responding

Agreement is reached on processes and time for further refinement.

Refine them when you have a good degree of confidence they will be funded - otherwise you might be wasting a great deal of time.

The program strategy (i.e. future increments) are laid out at the beginning of the program with cost, schedule, and performance requirements in mind.

Table 19. ESC Responses to Round 2(c)/ Question 2

How do/would you incorporate all increments in a contractual document?

4 of 6 panelists responding

Increments are defined primarily the Technical Requirements Document (TRD) which is a contract attachment.

Increments that are deliverables would be either individual CLINs or well defined within a CLIN deliverable. If there are undeliverable increments they are probably best defined in an EA plan included in the contract.

The particular need will define the contract vehicle. All tools in the contracting toolbox are available to you (e.g. Other Transaction, UCA, Contract Replan, Supplemental Agreement, and so on). How these requirements translate into a legally enforceable document is dependent upon the specific acquisition.

Clauses - not sure what would make sense here- I can't think of any special clauses except maybe "Total System Responsibility".

How would this appear in the contract document (CLIN, clause, attachment, etc.)? 4 of 6 panelists responding

The TRD is incorporated as an attachment. In some cases we have delineated specific spiral delivery dates in section F of the contract.

These would appear as a CLIN, attachment or a clause.

Basically, your assumption is correct; CLINs, Contract Attachments, and clauses will most likely be the places to capture the added requirements.

A special clause may be most appropriate as long as it made sense to use it.

Table 20. ESC Responses to Round 2(c)/ Question 3

One respondent presented the use of a unique award fee plan that included a Teaming Fee. Would this arrangement work for your acquisition? Why or why not? 3 of 6 panelists responding

Not sure.

A Teaming Fee used in the author's context was probably part of a "Fly-off" or "down select" where various teams competed for the development effort. Then one team or contractor would be chosen for follow on efforts. This is a highly esoteric arrangement contingent on, among other things, the legally binding arrangement or partnership between members of the contractor team and the acquisition strategy. In most ESC contracts such an arrangement is not necessary, but never say never!

Well the Award Fee arrangement I sent you last time was unique and was determined at a very high level. The contract is just over a year old and the teaming arrangement has a ways to go before it is deemed fully successful.

How would you define the evaluation criteria for such an arrangement?

2 of 6 panelists responding

What is/is not positive "teaming" is subjective. The Theater Battle Management Core System award fee criteria do include incentives for the contractor to work cooperatively with the Government as a team to attain important program objectives.

We usually define items to be incentivized in AF plans as areas of risk that we think might be mitigated by inclusion of an appropriate incentive or other areas that the Gov might have special interest in. Of course, in a sole source situation, contractor may strongly be influencing the evaluation criteria in an AF plan. I have seen AF plans with incentives for teaming, sometimes effective teaming with Government entities. On several long-term support/maintenance contracts for major systems, where contractors were taking over work the Government had long done, we have incentivized the contractors based upon their work, including transition, with Government entities.

Who would determine, evaluate, and approve these criteria?

2 of 6 panelists responding

Evaluation criteria are usually defined by the acquisition team but final determination and approval of the criteria, and evaluation after award is up to the Fee Determining Official (FDO).

The FDO, normally, would be the one that approves the Award Fee Plan. The language in the plan would involve many people and would probably include feedback from the contractor(s). I have a program that has a traditional award fee arrangement but is event driven. In this they arranged the award fee pools to be consistent with the importance of the event(s). This seems to work well and they also have TSR Clause.

Table 21. ESC Responses to Round 2(c)/ Question 4

If unconstrained by any other requirements and starting with a clean sheet of paper, can you think of a totally new contract arrangement that will facilitate flexibility?

3 of 6 panelists responding

Can't think of a totally new contract arrangement for this at this time.

The example of the commercial world, especially the IT industry, needs more attention. Specifically, the mindset/culture surrounding it. Cost plus contracts are not incentives. Today's young worker responds to team and personal incentives, it is the way Microsoft has thrived.

The written words are only important in that they capture a meeting of the minds. You know what you expect and the contractor delivers what you expect. Second, this meeting of the minds must be captured in a legally binding document. (The U.S. Supreme Court stopped doing contract law cases years ago because of this simple concept.) This is an age-old question that looks for a way around the bureaucracy. Bottom line is you need the meeting of the minds, an enforceable vehicle, and consideration exchange. Whatever the latest beltway spin is, there's no getting around these in government contracting. An ideal vehicle has these three items and is presented in a simple, clearly understood contractual document.

I guess the most flexible; least complicated arrangement is just one basic Cost Plus (AF/IF/FF) CLIN.

What are the advantages/disadvantages of your arrangement?
3 of 6 panelists responding

They also don't mind fielding something at 80% and working the bugs out later, a bit more risky in the defense business.

The contractual vehicle is kept simple and clearly understood.

The key is flexibility.

Table 22. ESC Responses to Round 2(c)/ Question 5

Two respondents observed that CICA was a constraint in an EA arrangement. Do you agree or disagree with this statement? Why? 4 of 6 panelists responding

Agree.

If you can define some of your spirals up front and compete them, this shouldn't be an issue.

I agree with the statement that CICA is a constraint, however this question hurts. As a warranted contracting officer, my job is to comply with the law, its spirit and intent. (Prisons are filled with folks who try to get around laws.) CICA has exceptions and ways to work them.

I am not sure I understand the CICA issue - The initial program should have been competed in the beginning. Systems type contracts seem to be going more towards sole source - the multiple mergers of large companies are also playing a role limiting competition.

How do/would you overcome the CICA requirements? 3 of 6 panelists responding

Need to document EA approach very clearly in the ASP briefing, the SAMP and the contract itself to demonstrate that an EA approach was approved at program initiation. This helps to respond to questions arising about re-competing at every spiral.

A down select process, if adequate funds are available, with several contractors thru an initial phase and then a limited competition for the balance, yes a J&A would be needed, can also be beneficial.

The work-arounds or legal exceptions are quite cumbersome, but since CICA is law, Congress or in some situations the Courts are the only folks who can give relief. There are exceptions to CICA (e.g. sole source contracts) that are workable. Trick is to get an early start - I cannot stress this enough - and get buy-in from all the stakeholders and roll

up your sleeves and work it. It's that simple and until the law is changed that's what must be done.

Have you been successful in doing so? 0 of 6 panelists responding

No responses provided.

Table 23. ESC Responses to Round 2(c)/ Question 6

We can trace EA back at least to 1993, and there have been comments that EA is just new packaging for an old idea. Do you agree? 4 of 6 panelists responding

I think it's largely a new concept.

Strategies like P3I sure sound like EA and date back much further than 93.

In my opinion EA is, as you state, new packaging of an old idea. The root of EA is the Acquisition Plan, if you want to trace the lineage further back, you need to revisit the budgeting process - appropriation, allocation, PMDs, etc.

While EA does seem like other initiatives, the main difference that I see is the emphasis on identifying at the start of the program, which future increments will have what capabilities and getting buy in from the user on the delivery strategy. Depending on the program, however, this is very hard for the warfighter to accept because funding is always cut, and if they agree to something less in the initial capability than what is documented in the ORD, they might never receive the future increments that give them the full ORD capability they are really after.

If so, how will you accommodate incremental development in your contracts?
4 of 6 panelists responding

Contractual implementation discussed in response to question 2.

Place emphasis on identifying at the start of the program, which future increments will have what capabilities and getting buy in from the user on the delivery strategy.

If not, what new ways will you use to contractually implement the EA emphasis?

4 of 6 panelists responding

In my nearly 20 years experience, myself and the teams I have served on always found a way to acquire what we needed. Granted, some ways are easier than others, but it always happened. Best advice is to get the MDA to buy into a well-worded Acquisition Plan; one that allows flexibility in the process so you do not always have to go to flag-level to get a decision on an evolution. This is much easier than it sounds but the bottom line is the better your preparation, the easier your program will be in the long run.

Bibliography

Aldridge, E.C., Under Secretary of Defense Acquisition, Technology and Logistics. “Aerospace and Transformation: The Mutual Implications.” Address to the American Institute of Aeronautics and Astronautics. 24 April 2002.

Armstrong, Martin A. The Delphi Technique. Princeton, NJ, Princeton Economic Institute, 1989

Assistant Secretary of the Air Force, Acquisition, Memorandum for MADS, FADS, PEOS, and DACS “Reality-based Acquisition System Policy for all Programs”. Washington DC 4 June 2002.

Ayers, Bradley. Instructor, Air Force Institute of Technology, Air Education and Training Command, Wright-Patterson AFB OH. Personal Interview. 19 August 2002.

Brown, B. “Delphi Process: A Methodology Used for the Elicitation of Opinions of Experts.” Santa Monica, CA: RAND Corporation., 1968.

Brown, B., Cochran S. and Dalkey N. *The Delphi Method II: Structure of Experiments*. RAND Memorandum RM-5957-PR. Santa Monica, CA: The RAND Corporation, June 1969.

Carr, David and Cone, Edward. “Spiral Development Beats Spiraling Costs.” *Baseline* 1:5 n pag.

Clayton, Mark J. “Delphi: A Technique to Harness Expert Opinion for Critical Decision-Making Tasks in Education.” *Educational Psychology*, 17:4 373-387 (December 1997).

Colarusso, Laura M. “USAF Acquisition Center of Excellence Focused on Streamlining,” *Inside the Air Force*, 13:6 (8 February 2002).

Dalkey, Norman and Olaf Helmer. *An Experimental Application of the Delphi Method to the Use of Experts*. RAND Memorandum RM-727-PR (Abridged). Santa Monica CA: The RAND Corporation, July 1962

Dalkey, Norman C. *Delphi*. RAND Report P-3704. Santa Monica, CA: The RAND Corporation, 1967.

Dalkey, Norman. *The Delphi Technique: An Experimental Study of Group Opinion*. RAND Memorandum RM-5888-PR. Santa Monica CA: The RAND Corporation, June 1969.

Dalkey, Norman C. and Bernice B. Brown. *Comparison of Group Judgment Techniques with Short-Range Predictions and Almanac Questions*. RAND Memorandum R-0678-ARPA. Santa Monica, CA: The RAND Corporation, 1971.

Defense Systems Management College. *Joint Logistics Commanders Guidance for Use of Evolutionary Acquisition Strategy to Acquire Weapons Systems 1998 Reissue*. Fort Belvoir, VA: DSMC Press, June 1998.

Defense Systems Management College. *Systems Engineering Fundamentals, Part 4, Planning Organizing and Managing*. Fort Belvoir, VA: DSMC Press, December 2000.

Defense Systems Management College. *Glossary Defense Acquisition Acronyms and Terms (Tenth Edition)*. Fort Belvoir, VA: DSMC Press, January 2001.

Delbecq, A.L., Van De Ven, A.H. & Gustafson, H. *Group Techniques for Program Planning*. Glenview IL: Scott Foresman and Company, 1975.

Department of the Air Force. *Evolutionary Acquisition for C2 Systems*. AFI 63-123. Washington: HQ USAF, 1 January 2000.

Department of the Air Force. *Air Force Evolutionary Acquisition Guide (Draft)*. Washington: HQ USAF, March 2000.

Department of Defense. *Development of Innovative Contract Incentives*. Breakthrough Rapid Improvement Team Report. Washington: HQ DoD, 4 October 2000.

Department of Defense. *Operation of the Defense Acquisition System*. DoDI 5000.2. Washington: HQ DoD, 5 April 2002.

Deputy Secretary of Defense, Acquisition. Memorandum for Secretaries of the Military Departments "Defense Acquisition". Washington DC 30 October 2002.

Edwards, Vernon J. "The True Story of the Wright Brother's Contract (It's Not What You Think)." Article. n.pag. <http://www.wifcon.com/analwright.htm>. July 2002.

Elsbernd, Gerald F. *The Use of the Delphi Method Within the Defense Department*. Air Command and Staff College, Maxwell AFB, AL, May 1974.

Hanratty, J. Michael, Lightsey, Robert H. and Larson, Arvid G. "Open Systems and the Systems Engineering Process" <http://www.acq.osd.mil/osjtf/msword/v2se.doc>. n.pag. 15 January 2003.

Hill, Robin. "What Sample Size Is "Enough" In Internet Survey Research?" *Interpersonal Computing and Technology*. 6:3-4. <http://www.aect.org/intranet/publications/iptc-j/1998/hill.asp#gay>. n.pag. (July 1998).

Linstone, Harold A. and Murray Turhoff. *The Delphi Method: Techniques and Applications*. Reading MA: Addison-Wesley Publishing Company, 1975.

Lyles, Lester L. "Transformation Crucial to AF Combat Capability," Article. n. pag. <http://www.skywrighter.com/editorial/2002/0503/8transformation.asp>. 3 May 2002

Meyer, Mary and Jane Booker. Eliciting and Analyzing Expert Judgment. San Diego: Academic Press Ltd., 1991.

Moore, Carl M. *Group Techniques for Idea Building*. London: Sage Publications, 1987.

Naval Post Graduate School. "Planning, Programming, and Budgeting System." Excerpt from class material for Financial Management in the Armed forces. n.pag. <http://pcc.nps.navy.mil/PPBS/ppsbs.html>. January 2003.

Office of Federal Procurement Policy. *Federal Acquisition Regulation (FAR)*. Chapter 1 of Title 48, Combined Federal Regulations. Washington: OFPP, 01 January 2003.

Perry, William, Acquisition Reform: A Mandate for Change, *Defense Issues*, Washington, DC: US Department of Defense, Vol. 9, No. 10, pp. 1-5. 9 February 1994.

Pike, John. "C-17 Globemaster III Block Upgrades," Excerpt from unpublished article. n.pag. <http://www.globalsecurity.org/military/systems/aircraft/c-17-block.htm>. 31 July 2002.

President's Blue Ribbon Commission on Defense Management. "A Quest for Excellence." Washington D.C. 30 June 1986.

Ratnam, Gopal. "Aldridge Outlines Faster 'Spiral' Procurements". *Defense News*, 2:4 (3 February 2002).

Rothenberg, Jeff. Lecture, SEI Workshop, Spiral Development and Evolutionary Acquisition. RAND Revision SEI-2000-09-07. The RAND Corporation, Santa Monica CA. 7 September 2000.

Sackman, H. *Delphi Critique*. Santa Monica CA, The RAND Corporation 1975.

Senate Armed Services Committee. *Statement of The Principal Deputy Under Secretary of Defense for Acquisition, Technology & Logistics*. Hearing, 107th Congress, 2nd Session, 2002. Washington: GPO, 27 February 2002.

Simmerman, Scott. "Dis-Un-Empowerment by Better Management Roadblocks." <http://www.squarewheels.com/scottswriting/roadblocks.html>. n.pag. Performance Management Company (1998).

Spinelli, Teri. "The Delphi Decision-Making Process." *The Journal of Psychology*, 113, 73-80 (January 1983).

Subcommittee on Defense House Appropriations Committee. *Statement of The Under Secretary of Defense for Acquisition, Technology & Logistics*. Hearing, 107th Congress, 2nd Session, 2002. Washington: GPO, 2002.

Tougaw, Ronald L. Jr. *A Delphi Expert Assessment of Professional Certification Programs for Contracting Personnel*. MS Thesis, AFIT/GAQ/ENV/01M-15. Graduate School of Engineering and Management, Air Force Institute of Technology (AFIT), Wright-Patterson AFB, OH, March 2001.

Uhl, Norman P. *Using Research for Strategic Planning*. San Francisco: Jossey-Bass, 1983.

Under Secretary of Defense, Acquisition, Technology and Logistics. "Other Transactions" (OT) Guide for Prototype Projects. Washington DC: USD (AT&L), 21 December 2000.

Under Secretary of Defense, Acquisition, Technology and Logistics, Memorandum for Secretary of the Air Force "Cost-as-an-Independent Variable (CAIV) and Spiral Development Implementation Plans". Washington, DC, 19 January 2002.

Under Secretary of Defense, Acquisition, Technology and Logistics. Memorandum for Secretaries of Military Departments "Evolutionary Acquisition and Spiral Development." Washington DC 12 April 2002.

Waldo, Jim. "The End of Protocols or Middleware for the New Millennium." Middleware 2000. n.pag. www.research.ibm.com/Middleware2000/Keynotes/waldo.pdf. Sun Microsystems 4 April 2000.

Vita

First Lieutenant Gary L. Wellman was born in Quincy, Illinois and graduated from Quincy Notre Dame High School. In April 1989, he enlisted in the United States Air Force and was assigned to the 2nd Munitions Maintenance Squadron at Barksdale AFB, Louisiana where he served as a nuclear weapons specialist. In May 1994, he received his Bachelors of Science Degree in Industrial Technology from Southern Illinois University in Carbondale, Illinois. Lieutenant Wellman cross-trained into the contracting career field in 1995 and earned contracting officer warrants at Lackland and Laughlin AFBs in Texas. He was commissioned a Second Lieutenant in the United States Air Force on 2 July 1999, upon completing USAF Officers Training School at Maxwell AFB, Alabama.

Following his commission, he was assigned to the F-16 Program Office at the Aeronautical Systems Center, Wright-Patterson AFB, Ohio. While at the F-16 SPO, he served as a buyer for the European Participating Air Forces and for the Common Configuration Implementation Program for USAF. In August 2001, he entered the Graduate School of Engineering and Management at the Air Force Institute of Technology (AFIT), Wright-Patterson AFB, Ohio. Upon graduation, Lieutenant Wellman was assigned to the Faculty, School of Systems and Logistics at AFIT.

REPORT DOCUMENTATION PAGE					<i>Form Approved OMB No. 074-0188</i>
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1. REPORT DATE (DD-MM-YYYY) 25-03-2003		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From – To) Aug 2001 – Mar 2003	
4. TITLE AND SUBTITLE A DELPHI EXPERT ASSESSMENT OF PROACTIVE CONTRACTING IN AN EVOLUTIONARY ACQUISITION ENVIRONMENT			5a. CONTRACT NUMBER 5b. GRANT NUMBER 5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Wellman, Gary L. First Lieutenant, USAF			5d. PROJECT NUMBER 5e. TASK NUMBER 5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S) Air Force Institute of Technology Graduate School of Engineering and Management (AFIT/EN) 2950 P Street, Building 640 WPAFB OH 45433-7765				8. PERFORMING ORGANIZATION REPORT NUMBER AFIT/GAQ/ENV/03-09	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) AFMC/PK Attn: Col. Jeffrey Parsons 4375 Chidlaw Road WPAFB OH 45433-5006 Jeffrey.Parsons@wpafb.af.mil				10. SPONSOR/MONITOR'S ACRONYM(S) 11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT This study used structured group discussions (The Delphi Method) among three groups of contracting professionals from the Air Armament, Aeronautical Systems, and the Electronic Systems Centers in order to identify potential roadblocks to implementation of Evolutionary Acquisition strategies. The Delphi groups also tackled the problem of identifying and exploring potential business strategies that may counter the identified challenges. Discussions revealed that current laws, regulations, and internal processes pose challenges in an evolutionary acquisition environment. No single business strategy emerged as the best way to implement the EA strategy. Participants suggested that all three Centers concluded that robust business planning, pre-contract agreements between the Government and the contractor, long-term relationships, and encouraging team behavior are key factors. Participants from all three Centers are accommodating evolutionary acquisition with current contract types. Multiple contract types are being combined under one contract vehicle; award and incentive fees are being tailored to motivate specific contractor behavior. The best strategy for an evolutionary acquisition may be a strategy that is tailored to the specific requirement.					
15. SUBJECT TERMS Contracts, Incentives, Evolutionary Acquisition, Acquisition, Procurement, Planning					
16. SECURITY CLASSIFICATION OF: a. REP ORT U		17. LIMITATION OF ABSTRACT b. ABSTRA CT U	18. NUMBER OF PAGES c. THIS PAGE UU 200	19a. NAME OF RESPONSIBLE PERSON Paul W. Thurston, Major, USAF, LSB	
				19b. TELEPHONE NUMBER (Include area code) (937) 255-7777, ext 3276; e-mail: Paul.Thurston@afit.edu	

